HE PAPER INDUSTRY
and PAPER WORLD

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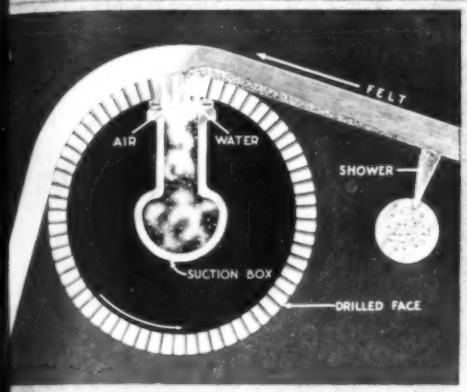

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Full Width Cleaning CONTINUOUSLY

The dotted area in the photograph indicates the suction box which extends entirely across the drilled face, inside of the Downingtown Suction Felt Cleaning Roll. No active part of the felt escapes this straight line cleaning zone, thus the cleaning action is uniform, straight across the full width of the felt . . . The sectional drawing shows why continuous operation cannot damage the felt nap. The travel of the felt turns the drilled shell of the roll, thus there is no friction drag over the box, no stretching of felt, no ironing of felt nap and NO POWER REQUIRED TO DRIVE THE ROLL ...This modern felt cleaning method invariably saves its cost in a few months' time...
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OXFORD PAPER CO.

Picture of a Rockwood Drive installation in the plant of this truly great manufacturer of book and other fine papers. This is an interesting installation where this big 150 h.p. motor drives to paper machine lineshaft.

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Makes paper mill machinery run better

and at the same time reduces costs.

Running costs are bound to be reduced because driven machine speeds are uniform and dependable when Rockwood pivoted-motor Drives are used. Production is increased because ample power is always available. There are no shut downs for drive failure or repair.

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With the Rockwood pivoted-motor base any desired part of the motor's weight, lightly cradled in the belt, is used, first to establish, and then forever after to automatically maintain just the right amount of belt tension for peak loads without belt slip. Rockwood Drives can be and are accurately engineered. They are the best of all short center motor drives. Belt life often is doubled and the drives require scarcely any maintenance.

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DRUM PRESS *
PRIMARY PRESS
MAIN PRESS

Note the short top felt for suction drum press nip. All plain primaries have been removed.

Wet pickup felt returns after suction primary press. Suction first press is on separate felt.

1. Removes large quantity water without disturbing formation or finish.
2. Reduces crushing and checking.
3. Improves finish. Reduces felt marks.
4. Permits use of light weight short top felt. Lower felt cost.
5. Eliminates several nips. Improves test of board.
6. Permits more bulk if desired.
7. Increases test or permits cheaper furnish and maintain same test.
8. Suction main press more efficient on separate felt.

* Suction drum press is equivalent to suction drum and suction primary press.

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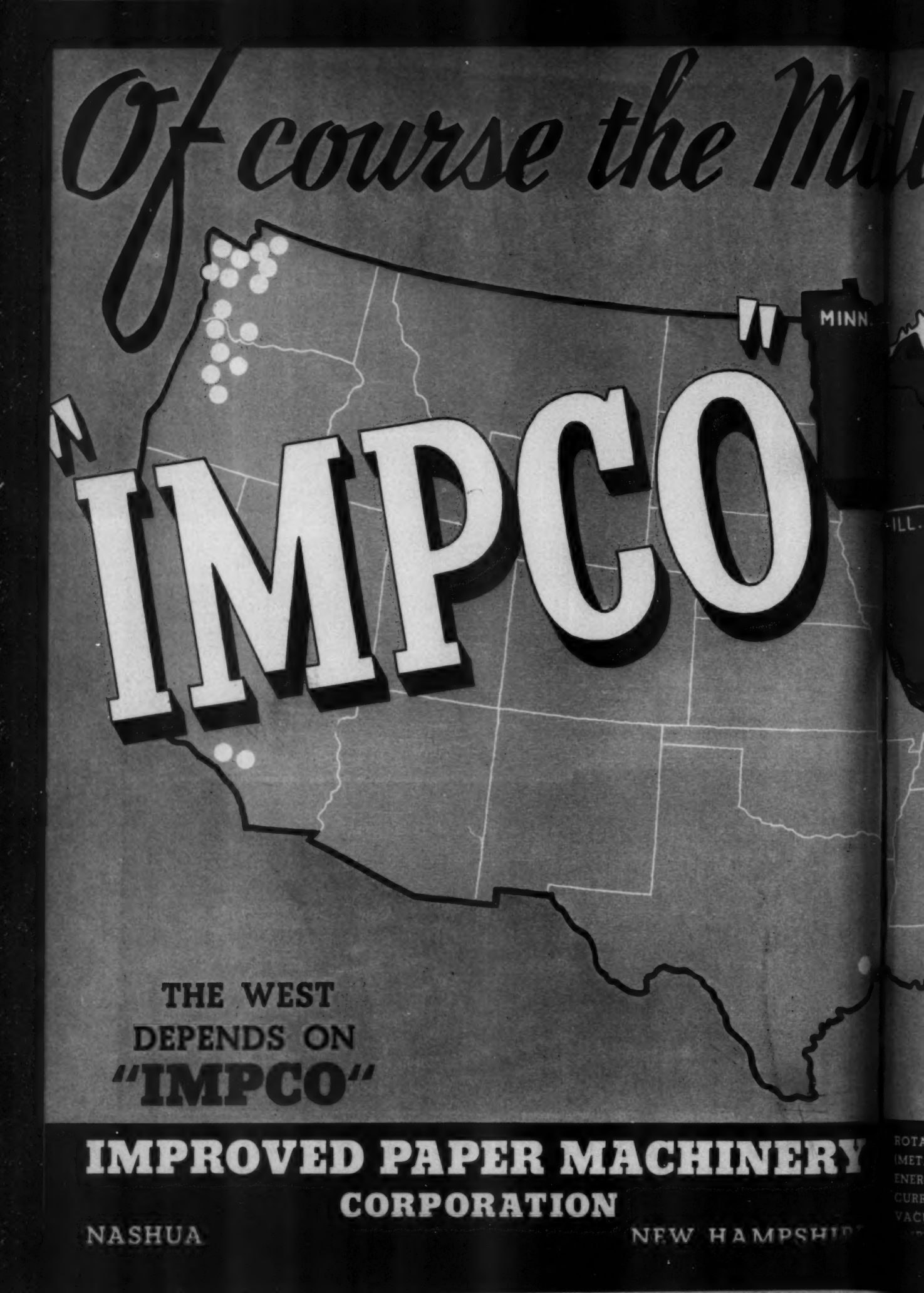
THE BELOIT WAY IS THE MODERN WAY

BELOIT IRON WORKS, BELOIT, WIS.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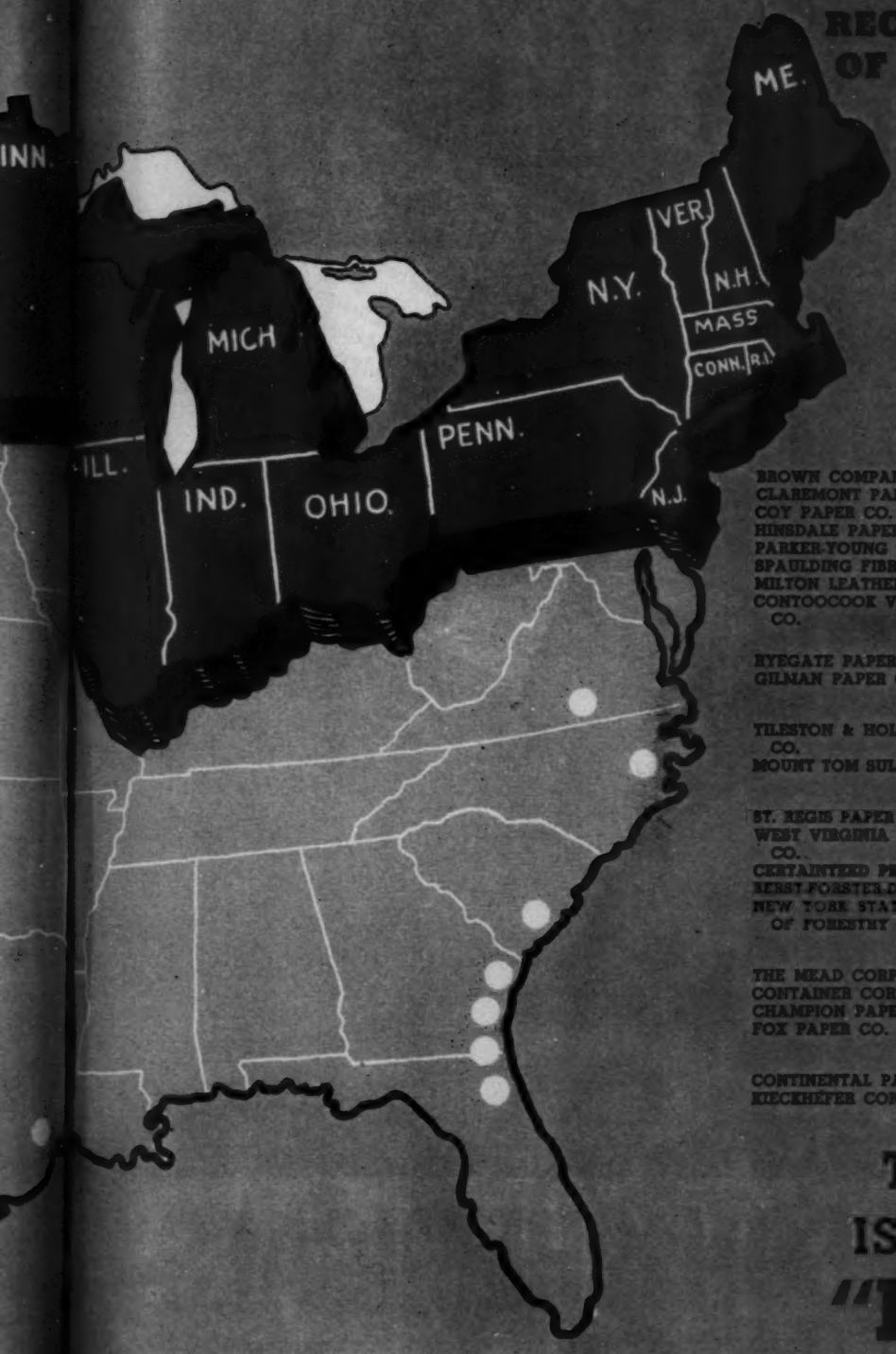

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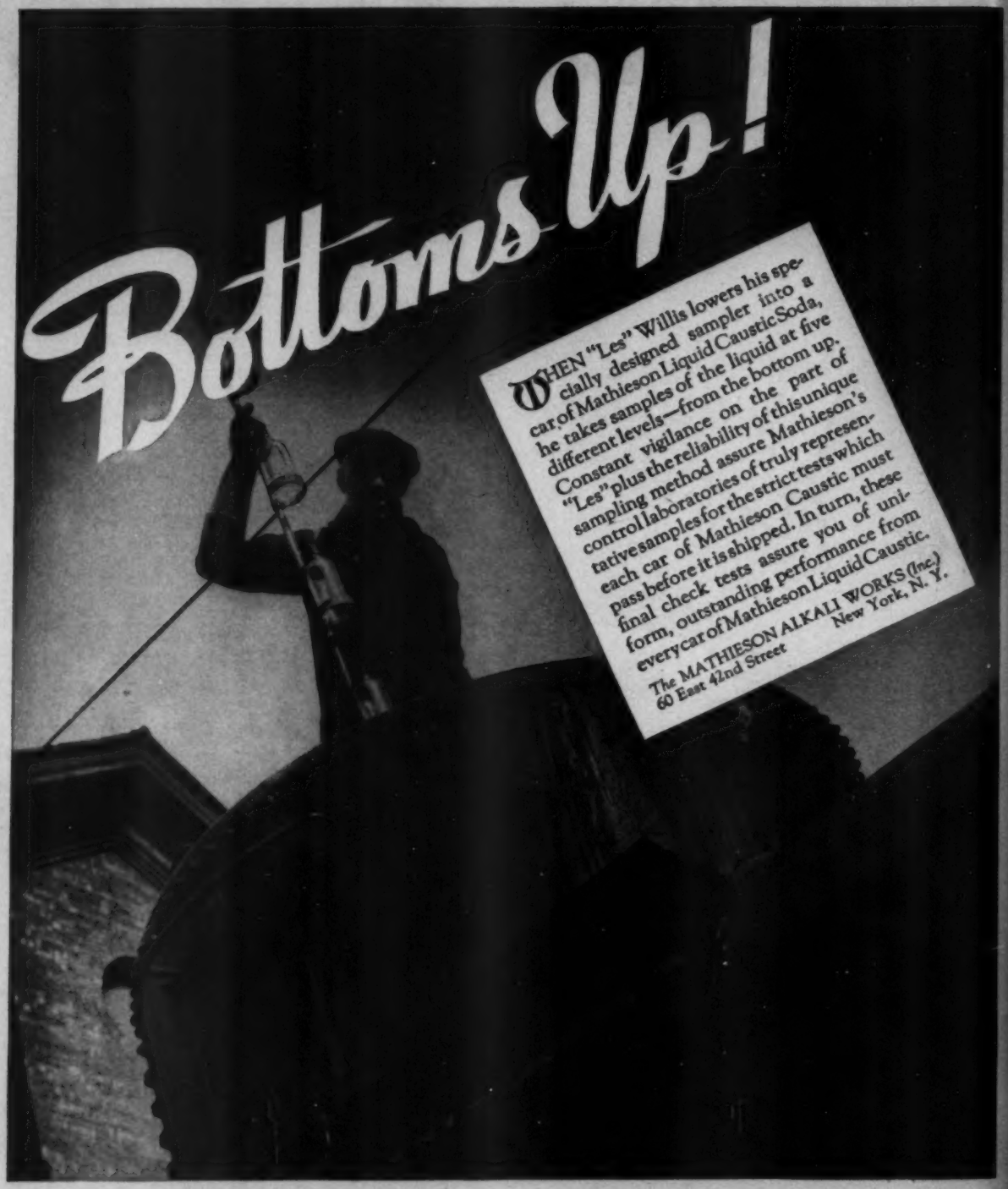
NASHUA NEW HAMPSHI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WHEN "Les" Willis lowers his specially designed sampler into a car of Mathieson Liquid Caustic Soda, he takes samples of the liquid at five different levels—from the bottom up. Constant vigilance on the part of "Les" plus the reliability of this unique sampling method assure Mathieson's control laboratories of truly representative samples for the strict tests which each car of Mathieson Caustic must pass before it is shipped. In turn, these final check tests assure you of uniform, outstanding performance from every car of Mathieson Liquid Caustic.
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PROVED" EQUIPMENT IS ASSISTING IN THE ECONOMICAL PRODUCTION OF QUALITY PULP AND PAPERS

THE PAPER INDUSTRY and PAPER WORLD

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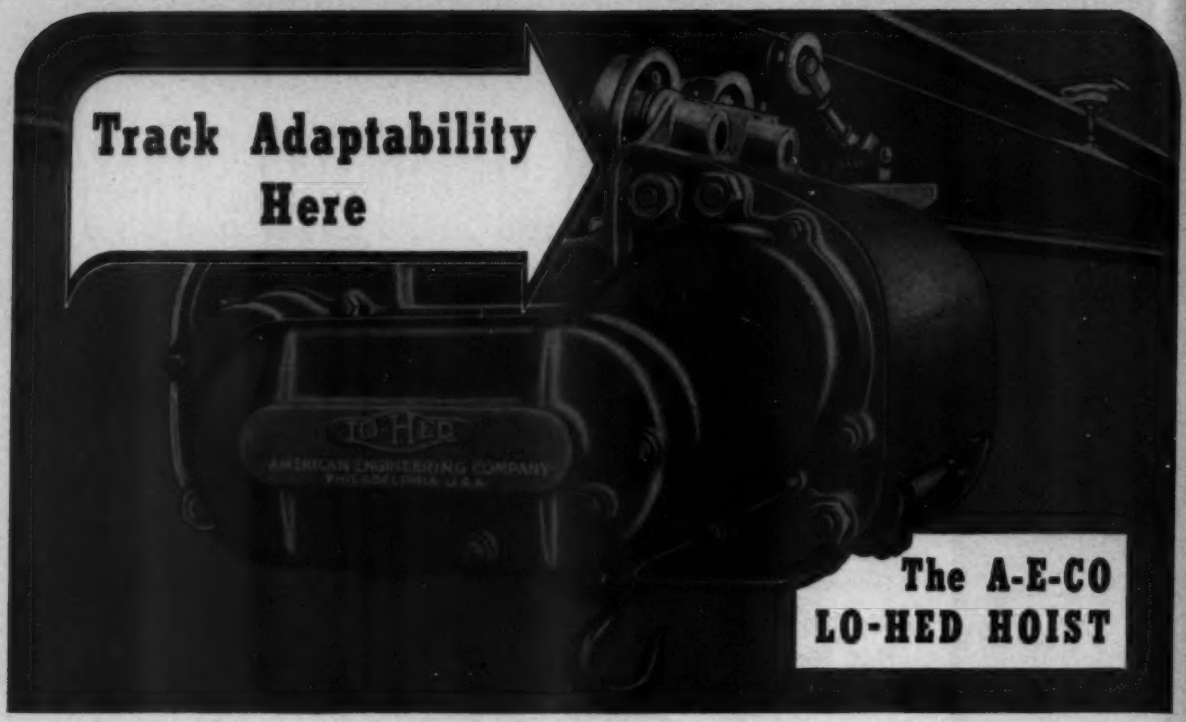

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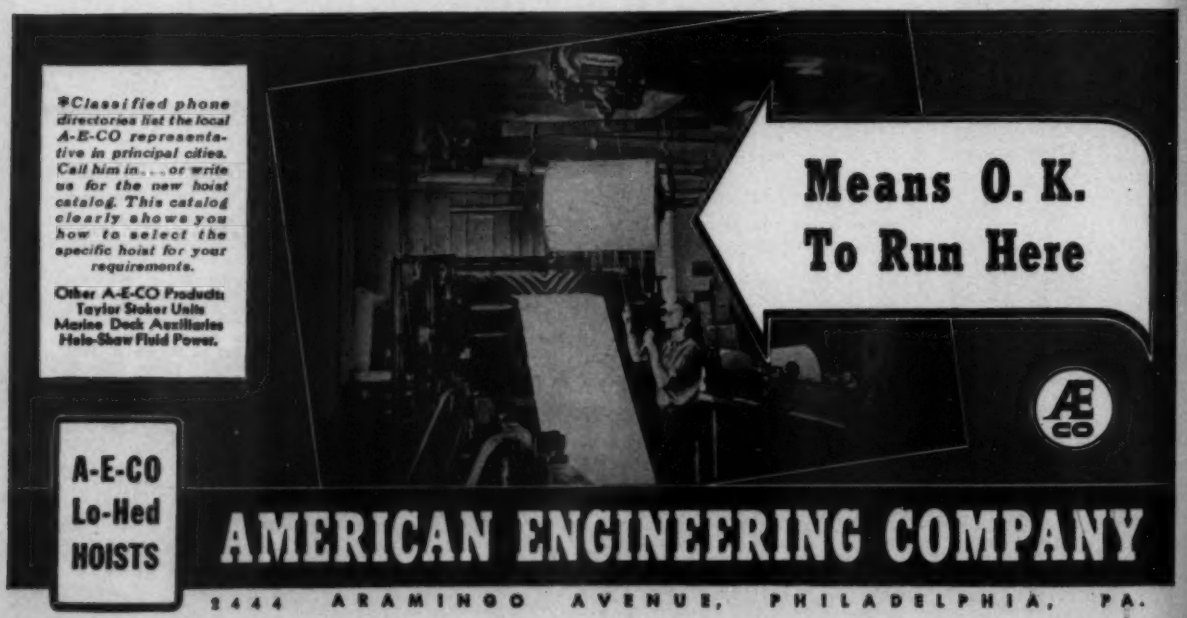
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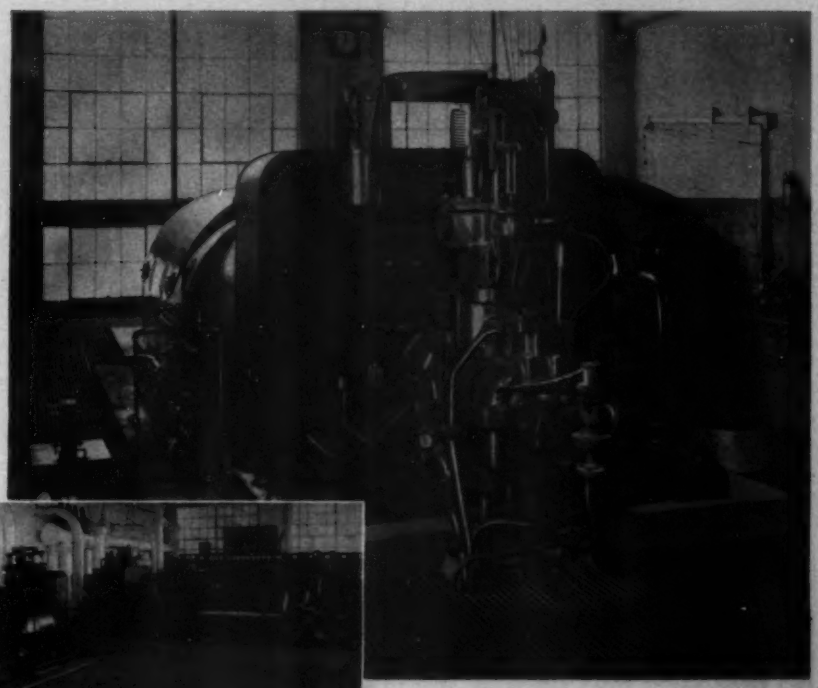
7 Years Performance

BACKS CHESAPEAKE'S DECISION



Chesapeake Corporation's new Westinghouse Turbine. It is rated 6250 KVA, 2300 volts, 1570 amperes, 80% power factor, 3 phase, 60 cycle, 3600 r.p.m. 450 lbs. steam pressure.

Chesapeake Corporation's 4 earlier Westinghouse Turbines are all lubricated with Texaco Regal Oil exclusively.

A NEW WESTINGHOUSE TURBINE has recently gone into operation in the power plant of the Chesapeake Corporation, West Point, Virginia. Texaco Regal Oil was chosen for the new unit.

Back of this decision is the performance of Regal Oil in four earlier Westinghouse Turbines in this plant. For seven years Texaco Regal Oil has provided perfected lubrication.

Texaco lubrication engineers will cooperate in the selection and application of Texaco Lubricants. 2186 warehouses assure prompt deliveries. To order, phone the nearest, or write:

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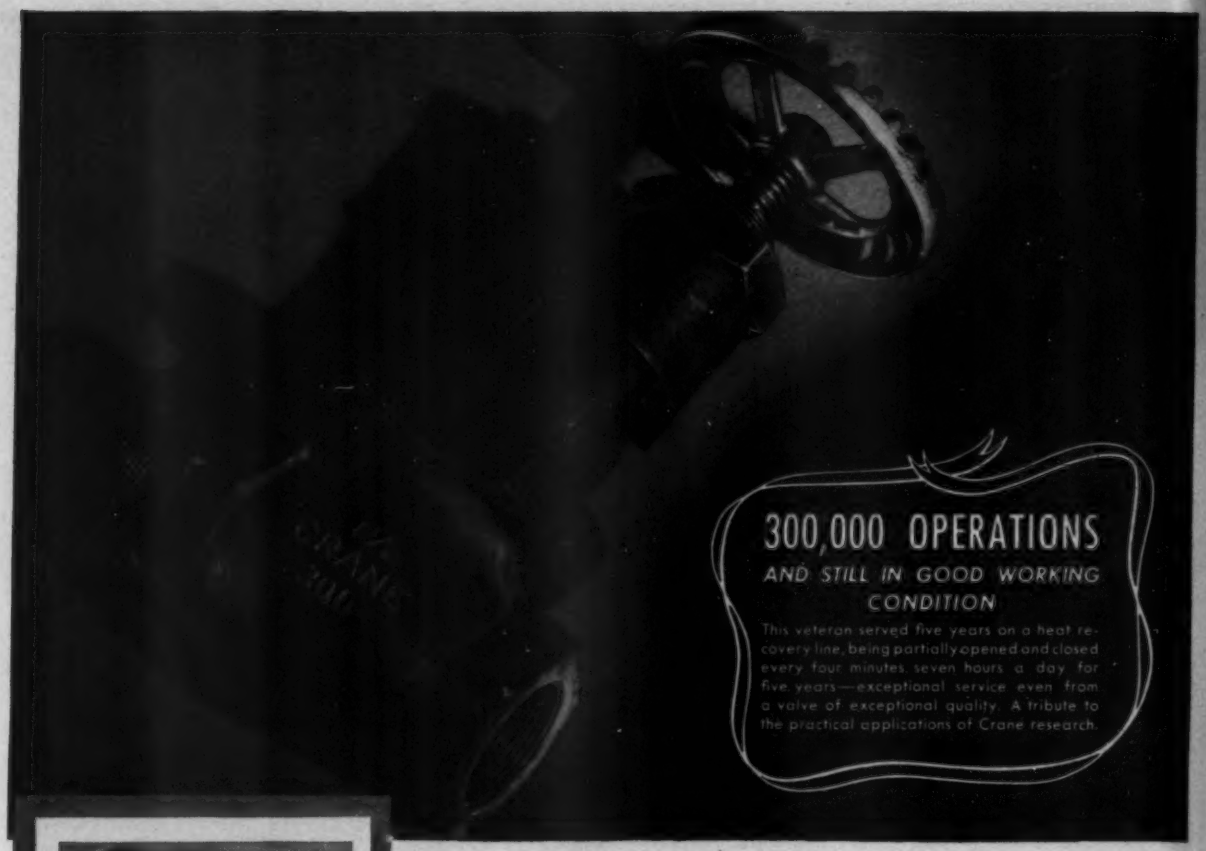
Texaco Dealers invite you to tune in The Texaco Star Theatre—a full hour of all-star entertainment—Every Wednesday Night—Columbia Network—9:00 E.S.T., 8:00 C.S.T., 7:00 M.S.T., 6:00 P.S.T.


300,000 OPERATIONS
AND STILL IN GOOD WORKING CONDITION
This veteran served five years on a heat recovery line, being partially opened and closed every four minutes seven hours a day for five years—exceptional service even from a valve of exceptional quality. A tribute to the practical applications of Crane research.

". . to unearth new facts"

Recently, the newly completed Crane Research Laboratories, housing the largest and best equipped research facilities in the industry, were opened to public view. In the foreword of a booklet published on this occasion, President Charles B. Nolte says:

"Research is misunderstood by a great many people, but in its simplest form it may be defined as an organized and diligent application of existing knowledge to unearth new facts. . . . Crane Co., therefore, is dedicated to the philosophy that only through continuing a well-organized program of research can it best serve its employees, its stockholders, the users of its products, and society in general."

TRANSLATING RESEARCH INTO DOLLARS FOR YOU

Crane research has as its objective the saving of dollars in your plant operation—the improvement of those valves and fittings whose responsibility it is to control all phases of flow.

Research in design and in new alloys has resulted in multiplying the life of valve stems—this improvement translated into longer life means dollars for you. Valve seats have greater resistance to erosion and corrosion because of research—and again research cuts your costs—saves you money.

Alloys have been developed capable of withstanding the searing cold of 150 degrees below zero—the scorching heat of 1300 degrees above, opening up new fields for you in the handling of liquids or gases at greater ranges in temperature. And in welding new alloys, Crane research has developed new techniques that make their use practical. Again this means increased production—more dollars in profit for you.

But research does not stop with these spectacular achievements . . . it also provides an accurate control of manufacture that guarantees the uniform, high quality of the valves and fittings you buy from Crane.

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NATION-WIDE SERVICE THROUGH BRANCHES AND WHOLESALERS IN ALL MARKETS

HOW ONE MILL DRAWS MONEY

out of black liquor

Automatic control in the recovery process soon pays for itself . . . adaptability and economy of Taylor Instruments proved once again

TEMPERATURE CONTROL isn't exactly brand new in pulp and paper mills. Neither is black liquor recovery in the digesting process. But perhaps not all mills know the adaptability of temperature control to the recovery of black liquor.

Taylor engineers have worked out a system that saves money in two directions. It may pay you to read how this method of control operates in one plant, which is a typical example.

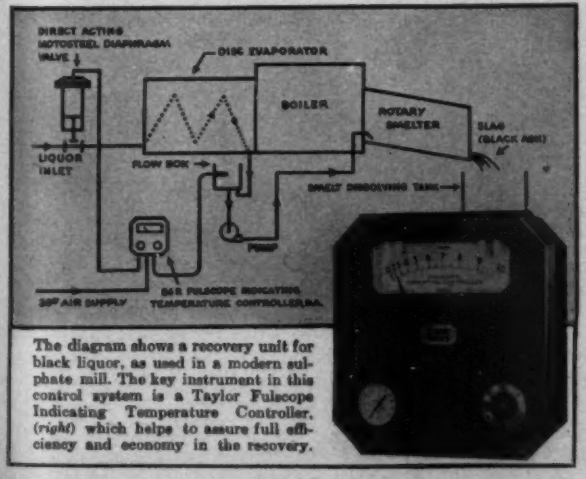
HERE ARE THE FACTS . . . A Taylor Indicating Fulscope Temperature Controller is used on the recovery unit. Vapor actuated, it works as a level controller, to maintain a steady feed rate. This guards against *insufficient* flow which decreases the production of both the recovered chemicals and steam—and *excessive* flow, which causes incomplete evaporation of water and improper combustion in the smelter.

Thus, by maintaining a steady, even flow, Taylor Control of this operation effects a saving both in the chemicals used to make white liquor, and in steam.

And this proves again the ability of Taylor engineers to adapt control of temperature, pressure and liquid level to the needs of the paper industry.

In every step of pulp and paper-making where these variables are present—at the grinder, the beater, the press roll, the digester, the super-calender, Taylor Control Systems are helping to make a better product, helping to cut conversion costs through more efficient operation.

Let a Taylor engineer show how Taylor Control can pay for itself through increased operating efficiency. Mills throughout the United States and Canada have proved the money-saving advantages of Taylor Control through years of continuous service. Write Taylor Instrument Companies, Rochester, New York. Plant also in Canada. Manufacturers in Great Britain—Short & Mason, Ltd., London, Eng.



The diagram shows a recovery unit for black liquor, as used in a modern sulphate mill. The key instrument in this control system is a Taylor Fulscope Indicating Temperature Controller, (*right*) which helps to assure full efficiency and economy in the recovery.

Taylor

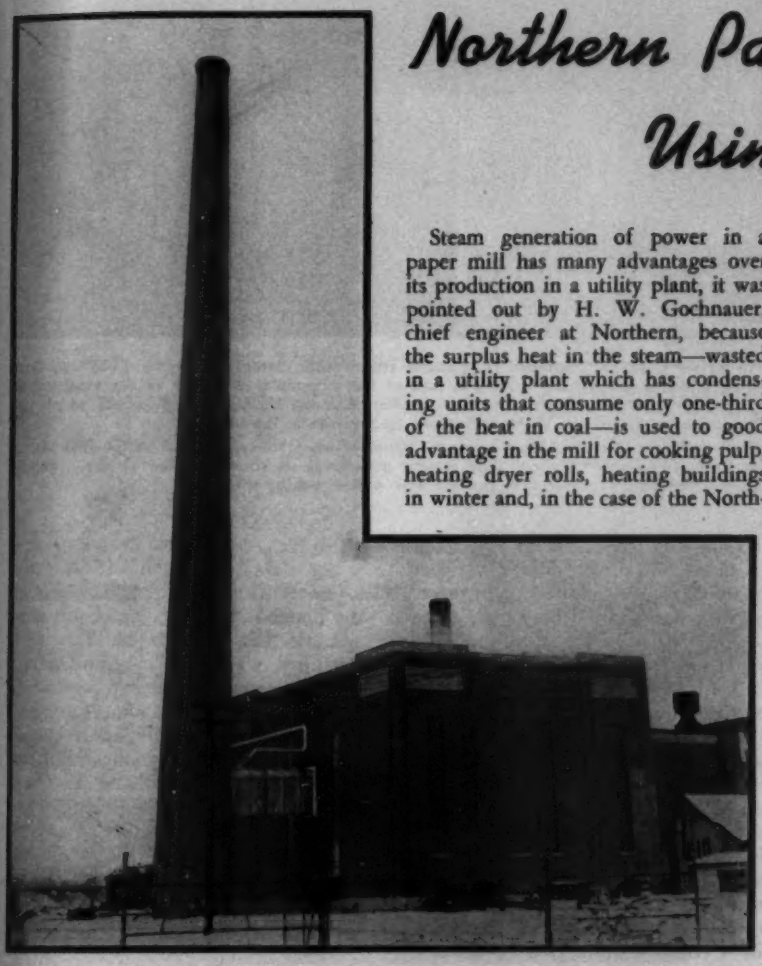
Indicating · Recording · Controlling

TEMPERATURE, PRESSURE, FLOW *and* LEVEL INSTRUMENTS

Vertical Dryers at Clifton

TRADE WINDS

Northern Paper Mills Using Own Power



This exterior view of the plant shows the dominating 225-foot smokestack and the power plant proper, with its glass brick windows, adjoining the paper mill.

Steam generation of power in a paper mill has many advantages over its production in a utility plant, it was pointed out by H. W. Gochnauer, chief engineer at Northern, because the surplus heat in the steam—wasted in a utility plant which has condensing units that consume only one-third of the heat in coal—is used to good advantage in the mill for cooking pulp, heating dryer rolls, heating buildings in winter and, in the case of the Northern, for supplying power to the steam engine drives on the paper machines.

NORTHERN Paper Mills at Green Bay, Wisconsin, "celebrated" the advent of the new year on January 3 when the final portion of its electrical current purchased from a private utility was "cut off" and its new $750,000 steam generating plant was "cut in" to supply all steam and current required for operation of every lighting and power demand.

The load had been added gradually over a period of a few weeks and the production of steam and power have been found to balance each other nicely with but a very small percentage of the steam energy generated being wasted, according to mill officials.

The problem—conquered practically a hundred per cent in the Northern's modern plant—was how to derive sufficient power from the steam for generation of current and still leave high enough exhaust pressure to drive paper machines and run the heaters.

This was met by having the boiler pressure exceedingly high — 650 pounds to the square inch. The steam machinery of the mills was constructed to operate at 150 pounds, the 500-pound drop from the boiler pressure to this figure being sufficient to operate the two turbo-generators of 5,000 kw. total capacity. A still further decrease to 30 pounds is provided for the heating system, and if there is an excess of steam remaining, it can be condensed as in a utility plant.

Republic Flow Meters Company desuperheater and reducing valve equipment, with a capacity of 100,000 pounds an hour from a pressure of 675 pounds at 700 deg. Fahr. to 450 deg. Fahr., regulate the steam flow. The huge reducing valves, controlled by mammoth springs, maintain the 150-pound pressure on the mill steam system by admitting steam direct from the boilers if the exhaust volume is insufficient. As the boiler steam, however, has a temperature of around 600 deg. Fahr. more than hot enough to melt lead—it must be passed through a desuperheater before being turned into the older lines. Similar valves keep the pressure even on the heating line.

Current in the new plant is supplied from two General Electric Company turbo-generators, one of 2,000 kv-a. capacity, or around 3,300 hp., and the other a 3,000 kv-a., or about 4,000 hp. The smaller generator was available from the old 150-pound plant and was rebuilt by substituting a new back-pressure, non-condensing turbine for the old condensing unit. The larger turbo-generator uses the old 2,000 kv-a. condensing unit which has been retubed and redesigned. Both generators turn over at a speed of 3,600 revolutions a minute and are closely controlled by General Electric control boards in the power plant at the main station, from the paper mill feeder and station auxiliaries.

Two Riley steam generating units supply up to 75,000 pounds of steam per hour at 675 pounds pressure and 700 deg. Fahr. The boiler operating the smaller turbo-generator has connected with it a Hofft company refuse burner and feeding equipment for burning up to 6,000 pounds of wood

Left—All major equipment in the Northern's new power plant is contained in a single room. This picture shows the 3,000 kw. General Electric Company turbo-generator in the center foreground and the 2,000 kw. unit at the extreme right. Back of the steel superstructure can be seen the Riley coal pulverizers, parts of the 120-ton capacity coal bunkers and the fronts of Riley boilers which are fed with pulverized coal. The white pipes at the right center are steam lines to the turbines.

Right—One of the twin Republic Flow Meters Company boiler control boards which regulate the consumption of 75,000 pounds of pulverized coal that go into the two Riley Stoker Corp. 700-pound 700 deg. Fahr. steam generators as shown in this picture. Visible to the right of the attendant is the Bailey steam flow and air flow gauge equipment.

bark—containing up to 66 per cent moisture—per hour. Each main boiler is equipped with two mills and two powdered fuel burners. Oil is used to start fires and the oil burners are so designed that they can produce up to 10,000 pounds of steam per hour if so small a load is ever desired. Besides the greater efficiency from the high-pressure plant, less expensive coal also can be used because of the use of powdered fuel firing compared to the former use of stokers in the old plant. The boilers are completely water-cooled on walls and floors and ash is removed in a dry form by a pneumatic conveyor to an outside elevated tank.

Coal from the mill's waterfront dock —where it is brought in and dumped by self-unloading steamers—is carried 1,000 feet on a Robins 18-inch belt conveyor which runs underground to the rear of the plant to an elevator which lifts the fuel to the hoppers on top of the plant. From there it drops to the pulverizers which grind the coal as fine as flour. This dust is blown into the furnaces by a jet of air, preheated by the flue gases so as not to lower the firebox temperature, and is burned as almost explosive violence. To relieve the force of any fuel explosion that might occur, explosion doors are provided at the top of the boilers.

A similar but shorter conveyor system connects with the wood room in the mill to carry bark and other combustible refuse and this waste is dumped midway on the coal conveying belt line and up the same elevator to another hopper on top of the building from which it is carried into the bark furnace with its heat being added to that of the coal.

Electric current in the new plant is generated at 440 volts, the highest voltage used in the mill, and is reduced by transformers to 220 volts for small power needs and lighting and to 110 volts for other lighting services. General Electric circuit breakers and Electric Storage Battery Company control battery equipment are housed in a concrete vault and operated by remote control.

As a result of extensive study and planning on various types of generating plants, it has been found with but a minimum of actual service that the new plant's electric load and steam load practically are in balance. Effort is made to save all possible heat. Pipes are covered with extra heavy asbestos coatings, all condensed water is returned to the boiler excepting steam used for agitating chips in the digesters.. Water is treated as it is taken from the river by The Permutit Company equipment, including an Anthrafilt filtering element and one hydrogen sodium zeolite softening unit to remove scale-forming chemicals. The mill water supply serves as condenser water when needed, eliminating the need for separate condenser pumps.

An elaborate system of the latest types of instruments and recorders on the Republic boiler gauge boards keep accurate measurements of draft, temperatures, water intake, steam output, coal consumption, current production and numerous other factors. One ingenious device on the boiler board can be compared to an automobile carburetor as it regulates the volume of air in relation to the consumption of coal and when the intake varies in amount according to the power demand, the ratio between the air and coal is kept constant.

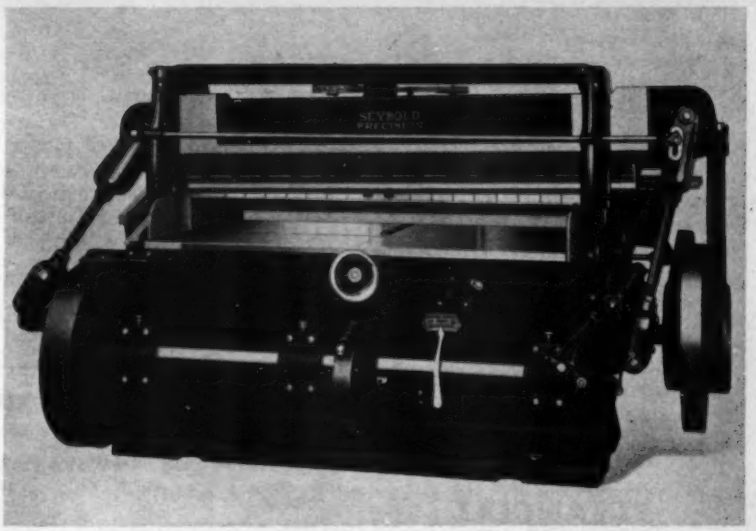
Because of the high temperature and pressure of the boiler steam, special fittings of drop-forged steel are required, made much to the specifications of big guns. The Buffalo Forge Company forced and induced draft fans—one set on each boiler—are driven from the same shaft by Allis-Chalmers motors, a 75 hp. on one end and a 150 hp. on the other, so that two different speeds may be provided for the incoming air draft and the stack gases, the volume of which remains the same.

Construction on the plant by the Baker Construction Company of Green Bay, with Sargent and Lundy, Inc., of Chicago, the consulting engineers, was started early in May, 1938, and the building was entirely built and most of the main interior equipment installed the middle of December.

DO YOUR CUTTING THE MODERN WAY

Leading Pulp and Paper Mills have learned the SEYBOLD way to PROFITS

Increasing in numbers, increasing in their dependence upon Seybold Cutting machines—this describes the surge toward modern cutting methods.



Modern Business Demands That Cutting Equipment Avoid . . . .

LOSS OF TIME
WASTE OF MATERIALS
INACCURACIES

★SEYBOLD PRECISION MILL TRIMMER

Answers these Demands with Speed • Accuracy • Long Life • Dependability • • •

★ **PRODUCTS BY SEYBOLD:** Book Compressors • Book Trimmers • Cutting Machines • Drilling Machines • Knife Grinders • Die Presses • Round Corner Cutters • Stamping Presses • Wire Stitchers.

SEYBOLD SALES AGENCIES

New York: E. P. Lawson Co., Inc. 426-438 W 33rd Street
Chicago: Chas. N. Stevens Co., Inc. 110-116 W. Harrison Street
Atlanta: J. H. Schroeter & Bro., Inc.
San Francisco, Los Angeles, Seattle: Harry W. Brintnall Company
Dayton: Seybold Factory
Toronto, Montreal: Harris-Seybold-Potter (Canada) Limited
London, England: Smyth-Horne, Ltd.
Latin America & West Indies: National Paper & Type Co., Inc.

SEYBOLD DIVISION • HARRIS • SEYBOLD • POTTER CO.
PIONEER BUILDERS OF SUCCESSFUL CUTTING EQUIPMENT
DAYTON • OHIO

The exterior of the new power plant, standing 52 feet high and having outside dimensions of 98 by 100 feet, is faced with red brick, similar to the beater rooms of the mill proper with which it is joined. The dominating part of the structure outside is the massive 225-foot smokestack which was erected by the Chicago General Concrete Construction Company.

The plant's interior walls are finished in ceramic tile, of straw color to a height of eight feet and cream colored above. Floors are terrazza and window wells are of glass brick. Turbines and boilers are contained in one large room which has been designed with sufficient foresight to allow for installation of a new generating unit and turbo-generator whenever needed.

A model of construction and efficiency, the Northern's new generating plant is expected to produce substantial economies for the mills as it replaces two hydroelectric plants which the company operated for the last 10 years on the Menominee river, 83 miles from Green Bay, from which power was transmitted over a 132,000 volt transmission line. Because of an over-abundance of power in the spring and fall when water levels were high and a lack of energy in the other seasons, necessitating the purchase of current from a private utility, steps were taken to build the plant for the company's requirements and sell the hydroelectric facilities.

◆

FINANCIAL

THE year end shows that the paper companies which have been in financial difficulties are gradually working out their reorganization problems, indicating that the year has resulted in a clarification of many difficulties which faced some of the mills when the year opened. Reorganization plans for Eastern Manufacturing Company, as well as for Stevens and Thompson Paper Company, have just been approved, and other companies expect to conclude their reorganization plans shortly. Meanwhile, financial reports show that the present trend of business in the paper field, while most of the figures show losses for the year, indicates a distinct upturn in the last few months.

A.P.W. Paper Company—Net loss for the September quarter was $1,735, slightly higher than the same quarter in 1937.

Bird & Son, Inc.—With the announcement of an apparent improvement in conditions, the company has voted bonuses to 1,500 employees, ranging for the older employed up to 4 per cent of their earnings.

Champion Paper & Fibre Company—Profits for the twenty-eight weeks ending November 6 were $10,946, or 14 cents per common share, as against $1,403,562 for the same period of 1937.

Crown Zellerbach Corporation—A net profit of $2,338,608 is reported for the six months ending October 31, compared with $4,440,801 for the same period in 1937. The earnings are equivalent to 44 cents per common share.

Dennison Manufacturing Company—A net loss of $88,000 for the first ten months compares with a profit of $470,000 for the same period of 1937.

P. H. Glatfelter Company—A year-end dividend has been declared of $4.25 per share, plus 44 cents per share as payment toward the accumulation of unpaid dividends.

Hinde & Dauch Paper Company—Bonuses totaling $35,000 were distributed to over 2,500 employees as a Christmas remembrance. The fourth quarter showed a marked pick-up in the company's business, with net earnings of about $200,000, compared with $400,000 for the entire balance of the year. The total for the year will be about $600,000, as compared with $1,400,000 in 1937.

Marathon Paper Mills Company—Earnings for the fiscal year ending October 31 were $267,135, or 99 cents per common share, compared with $3.93 per share in 1937.

National Gypsum Company — A New York banking group is offering 60,000 shares of $4.50 convertible cumulative preferred stock at $100 per share. The proceeds will be used to retire all of the 7 per cent preferred stock and the 5 per cent second preferred, and $900,000 will be expended on additions to the New York plant, with $300,000 expended for the land adjoining the plant. The stock will be convertible into common stock at 17 for the first year, 20 for the next two years, 23 for the next two years, and at 26 to November 30, 1945. It is redeemable at $105 to November 30, 1943 and at $103 thereafter.

Rayonier, Incorporated — A net profit of $64,895 was earned in the quarter ending October 31, as against a net loss for the preceding quarter of $183,264.

St. Croix Paper Company — Dividend payments, suspended since January, were resumed with a payment of $2 per common share in December.

Scott Paper Company—A bonus of $25 each, plus $1 for each year of service, was paid to 1,200 employees, with smaller sums to those in the com-

PRODUCTION RATIO REPORT

(Based upon paper production reports to the American Paper and Pulp Association)

COMPARATIVE MONTHLY SUMMARIES

Months	1938(c)	1937(c)	1936	1935	1934
January	63.9%	90.3%	76.1%	65.8%	—
February	68.7%	90.1%	77.9%	70.0%	—
March	69.6%	90.3%	76.0%	70.5%	—
April	68.3%	92.1%	82.3%	70.0%	—
May	69.0%	90.6%	81.6%	69.4%	—
June	66.0%	87.3%	80.7%	72.3%	—
July	72.0%	81.8%	77.3%	64.9%	—
August	77.2%	82.9%	81.5%	70.9%	—
September	76.3%	78.6%	80.5%	71.9%	58.2%
October	82.5%	73.5%	87.6%	75.6%	64.7%
November	79.6%	61.9%	88.0%	75.3%	61.7%
December	—	54.5%	85.9%	71.2%	59.6%
YEAR AVERAGE	—	80.6%	81.3%	70.5%	—
First 51 weeks	72.5%	81.3%	81.3%	70.8%	—

(c) Basic capacity data have been adjusted to correspond with ratings reported by individual companies.

(Totals for the last two weeks of November and the month of December have not yet been published. However, for the week of December 24, 1938, figures show 77.6% as against 48.6% for the corresponding week of 1937.)

(Total number of mills reporting November 19 to December 24, is 169. The ratio of 41 of these mills was 50% and under; 128 mills rated 51% to 100%.)

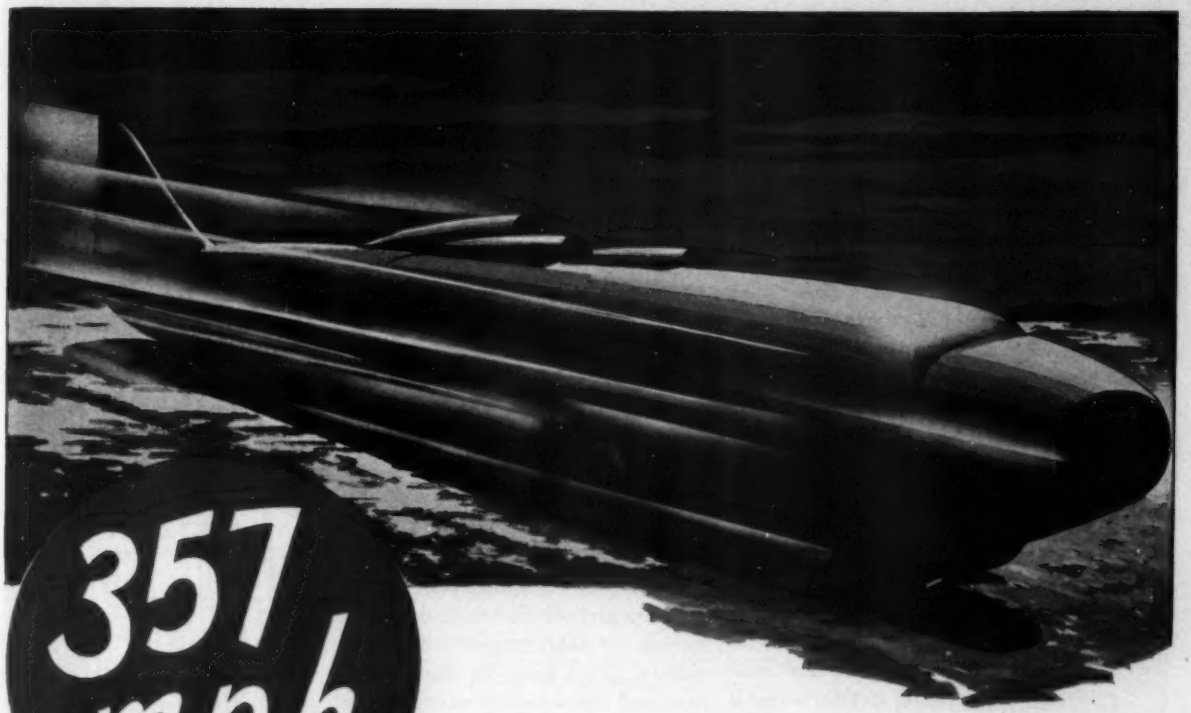
PAPERBOARD OPERATING RATIOS

According to reports from the National Paperboard Association, per cents of operation, based on "Inch-Hours", were as follows:

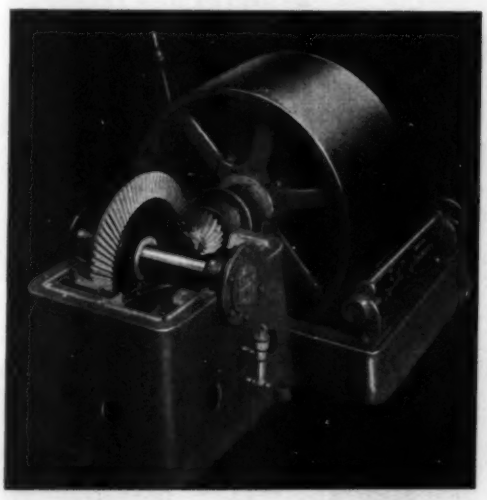
Months	1938(e)	1937(e)	1936	1935	Months	1938(e)	1937(e)	1936	1935
January	55%	80%	61%	61%	July	57%	67%	69%	59%
February	61%	86%	67%	67%	August	66%	74%	75%	63%
March	60%	87%	68%	67%	September	66%	70%	76%	69%
April	57%	89%	70%	61%	October	70%	66%	82%	76%
May	58%	86%	68%	61%	November	64%	56%	79%	70%
June	56%	75%	68%	65%	December	—	46%	74%	60%

Week ending December 24, 1938—69%

(e) Basic figures revised to include new member of National Paperboard Association. December 29, 1938.



What a Tribute to Modern Engineering!



Did you ever stop to think about the work Capt. Eyston did before he drove his speed monster 357 miles an hour? Spectacular as it was, his dash across Utah's salt flats last August tenth was but the fitting climax to months of designing, building, and testing.

It is the same way with the performance of Black-Clawson and Shartle paper mill machinery. Back of its characteristic high efficiency lie thousands of hours spent in field research, drafting room, and laboratory. It also is a tribute to modern engineering.

Put the benefit of Black-Clawson-Shartle engineering to work in your mill. Ask for information about the particular B-C-S equipment in which you are interested. The Black-Clawson Co., Hamilton, O. Owners of Shartle Bros., Middletown, O.

BLACK-CLAWSON SHARTLE BROS.

DOWN WENT THE MERCURY—35°!

Shell showed this paper company how to keep its speed reducer cool*

A LARGE Wisconsin paper and pulp company was having trouble with the speed reducer driving their paper-drying machine.

Failure of the lubricant used on the enclosed hypoid gears was causing the reducer to run at extremely high temperatures. Excessive carbon formation was clogging oil holes and grooves, and it was necessary to change the lubricant every six days.

Realizing that breakdown of the speed reducer meant shutdown of the entire paper machine and auxiliary equipment, this company called on Shell to help solve their problem.

Working with the company's maintenance men, the Shell engineers made a thorough examination of the speed reducer. They then recommended the proper type and grade of Shell Lubricant for this particular job.

The results were immediate. With the Shell Lubricant, the former operating temperature was reduced by 35° F.! There was no carbon formation, and, after eighteen days' operation, all oil holes and oil grooves were found to be free and clean!

Some of the toughest problems of industrial lubrication have been solved by Shell engineers in paper plants. They bring to *your* problem skill developed from experience in solving others' problems. Their tools are the finest lubricants being refined today. This "plus" in lubrication is always ready to help you. Simply write or call your nearest Shell office.

*Case History No. 1023 from Shell's files.

SHELL *PAPER MILL* LUBRICANTS

pany's employ for less than a year.

Soundview Pulp Company—Net income for eleven months to December 1 was $453,487, compared with $1,716,047 for the same period of 1937.

Union Bag and Paper Company—Notice has been filed of the issue of 210,455 shares of capital stock without par value. The stock will be offered at the rate of one share for every five shares held by present stockholders. An issue of 4½ per cent notes for a total of $4,600,000 has been authorized, two insurance companies taking the notes for investment.

New York Stock Exchange—Stocks

	Closing Price Dec. 31, 1938	High and Low Prices for 1938 High	Low
A.W.P. Paper	2⅜	4½	2
Celotex	18⅞	19⅛	12⅜
Same Preferred	67	72½	46
Certain-teed Prod	11⅞	12½	4½
Same Preferred	42	46	17½
Champion P & F Co.	30	38¼	18
Same Preferred	105	106	94
Container Corp.	16¼	17¾	9¾
Cont. Diamond	9¼	11⅞	6
Crown Zellerbach	14⅜	15⅛	7½
Same Preferred	87	92½	58
Dixie Vortex	11¾	17	8½
Same "A"	34⅛	35	28¾
Flintkote	31⅛	31¼	10⅞
Robert Gair	4	5⅞	2½
Same Preferred	12¾	18	10
Gaylord Container	19	19½	13
Same Preferred	51⅞	52	48
International P & P	14½	15⅛	4¼
Same Preferred	50¾	52⅞	18⅜
Kimberly-Clark	27½	30	19
MacAndrews & Forbes	32	32	22
Masonite	57	61	25
Mead Corp.	11½	15¾	6¾
Same Preferred	69	80	55
Paraffine Co.	59	61⅛	29
Same Preferred	102	102	88¾
Rayonier	17¼	24½	8⅛
Same Preferred	23½	29⅛	18
Scott Paper	48½	50⅞	34¾
Same Preferred	113¼	113¾	112½
Sutherland Paper	29⅝	32	17
Union B & Paper	12	15¼	7⅞
U. S. Gypsum	112	115	55
Same Preferred	173	173	162½

New York Stock Exchange—Bonds

Celotex 4½%	89½	92¾	59
Certain-teed 5½%	79⅞	85⅛	49
Champion P & F Co. 4¾%	99¾	106	95½
Same (38)	100	100	97
Container Corp. 5%	104	105¼	48⅞
Same 6%	99¾	100	83
Inter. P & P 6%	92¾	93	54
Same 5%	99⅝	99⅝	80½
Mead Corp.	103⅛	107¼	97½

New York Curb Exchange—Stocks

Am. Boxboard	7¾	12¼	6⅛
Brown Co. Preferred	18½	33	15¼
Det. Paper Prod.	1¾	3¾	1¾
Gt. Northern	38½	39½	25½
Hummel Ross	3¾	6¼	2¼
Nat. Container	6½	9¼	5½
St. Regis	3⅛	4⅜	2⅛
Taggart	4¾	6½	2⅜
United Wall Paper	2⅜	3⅜	1½

M. & O. COMPANY MODERNIZES ITS NO. 3 MACHINE

The Minnesota and Ontario Paper Company recently completed another step in the program of equipping the International Falls (Minn.) plant to manufacture high grades of paper by installing a new wet end on the No. 3 machine. The change-over to the new equipment was made in the record time of only nine operating days.

This machine has been completely modernized and is now well suited to the manufacture of paper to rigid specifications on a production basis. The new equipment, supplied by the Pusey and Jones Corporation, who built the original machine, includes new screens, head box, fourdrinier section with suction couch, a rubber covered suction press, smoothing press and anti-friction bearings for the dryer felt rolls. The fourdrinier is arranged for a 184-inch wire and is complete with new frames, breast, table and wire rolls, all in anti-friction bearings in addition to an improved adjustable shake and a number of other features that make it most flexible for the production of a wide variety of papers.

The Minnesota and Ontario Paper Company, in following out its rehabilitation policy, has made other changes prior to the machine changes. These include a new groundwood mill, a Chemipulp system, additional pulp screens, the replacement of stock and water lines and the tile lining of chests to assure the delivery of clean quality pulp to the paper mill. With these improvements already made and the modernization of the No. 3 machine just completed, the M. & O. Company contemplates still further improvements during 1939.

◆

A.W.P. ANNOUNCES EXPANSION PROGRAM

Anticipating a good year in business, the American Writing Paper Corporation, Holyoke, Massachusetts, is embarking on an expansion program for 1939 in which new machinery will be installed in various divisions, according to announcement by Leon M. Yoerg, president and general manager of production.

Mr. Yoerg's statement follows: "The changes at the Parsons division are to make the three machines more flexible so that loft dried bonds, and ledger papers, air dried bonds, Index bristols and specialties can be made interchangeable on all three machines.

"The result will be better service to our customers. Other auxiliary equipment such as modern cylindrical screens, save-alls, automatic control of drying are being installed in the Parsons division as well as other divisions of the company."

Mr. Yoerg also announced that William J. Lamery, superintendent of the Crocker division, has been promoted to be his assistant. Mr. Lamery succeeds Leonard Taylor, recently named superintendent of the Byron Weston Paper Mill in Dalton, Massachusetts. Mr. Lamery's position is taken by Howard Ferguson, who has been employed at the Crocker division for some time.

In announcing these appointments, Mr. Yoerg said it was in line with the company's policy to make promotions from within the organization whenever possible.

Mr. Yoerg said that 1939 looked like a good year, and that at present there are 1200 persons on the payrolls. All 14 machines are in operation.

◆

MEAD-ALEXANDER FORECAST GOOD BUSINESS FOR '39

Optimism over the prospects of the paper industry during 1939 has been expressed by two prominent Central Wisconsin paper mill men—George W. Mead, president of the Consolidated Water Power and Paper Company, and John E. Alexander, president of the Nekoosa-Edwards Paper Company.

The Consolidated firm, concentrating on its new patented coated book paper used by *Life* magazine and other large publications, operates mills at Wisconsin Rapids, Biron, Stevens Point and Appleton. Nepco, featuring both wrapping and fine bond papers, controls large mills at Port Edwards and Nekoosa.

"We are still in a period of uncertainty," stated Mr. Mead. "Business experts are sending out the word that there will be a slow and gradual improvement during the next twelve months. They assure us that we are definitely rising from the depression. Men engaged in the paper industry continue to be expectant and hopeful."

Equally encouraging was Mr. Alexander who said: "Business is getting its feet on the ground. There is a saner mental attitude being manifest with respect to regulations, taxes and other handicaps imposed on business. This is heartening for with this change will come a new spirit and courage to go forward. Optimism is contagious and soon all business will respond. 1939 will be a more rational year than 1937

Nepco's Salesmen Gather For Annual Conference

Left to right, kneeling: R. A. Love, A. L. Brown, N. E. Nash, W. E. Nash, Jr., C. A. Hodlmair, I. N. Frisby, Lyle Anson, C. H. Reese, J. E. Alexander, president of the firm. Middle row, standing: J. J. Lawson, R. W. Herzog, Lee Turley, M. A. Vanderheiden, C. A. Schiebler, Tad Meyer, D. E. Smith, Hans Hartwig, J. A. Huchter, Adam Remley. Back row: Dr. T. A. Pascoe, A. J. Hayes, Frank Pelot, Larry Lyons, Dick Nugent, R. J. Knowles, C. C. Parvin, Ward Rosebush, John Manske, Dr. R. C. Crain, Alson Cole, Ken Podvin, R. S. Holcomb. (Bill Gardiner, promotional man, missed the picture.)

or 1938. Paper mill management is awake and I firmly believe prices will be uniformly firmer and the general law of supply and demand will take effect."

◆

MONROE, MICH. TO BUILD NEW PORT TERMINAL

Plans for the construction of terminal facilities for the Monroe (Michigan) harbor are proceeding rapidly and the contract for the initial construction was awarded recently by the port commission. The completion of the Monroe harbor is of vital interest to the paper industry in the Monroe and Kalamazoo districts, inasmuch as pulp shipments originating in Europe and the South can come via the St. Lawrence and Great Lakes at a considerable saving in transportation expense.

The terminal will be built through a grant by the PWA. Approval of the $128,250 outright grant from the PWA and an additional $156,750 in the form of bonds for the $285,000 terminal project came after the port commission's application had been twice rejected. The first contract, involving $110,081, will include installation of sheet steel piling, excavation and backfill.

The Monroe harbor is connected with Lake Erie by a channel 26 feet deep and 300 feet wide. It was completed in 1937 at a cost of over $1,000,000 which was shared by the Monroe industries and the City of Monroe. With the completion of the port terminal it is understood that the savings to paper mills in the Kalamazoo district on pulp shipments will be about $1.00 per ton.

NEPCO PLANS SALES FOR 1939

Plans for 1939 were outlined and disscussed and several changes of personnel announced at the sixth annual sales conference of the Nekoosa-Edwards Paper Company, Port Edwards, Wisconsin, December 19, 20 and 21. The discussions were divided into two groups: fine papers and wrapping papers.

Among the speakers at the conference were N. A. Altmann, vice-president of the Butler Paper Corporation; E. B. Nattemer, publisher of the magazine, *Meat*, and Phil Howard, widely-known publisher of the *American Paper Merchant*. At the conference it was learned that C. A. Polansky was transferred to the main office from New York City and that Lyle Anson would replace him in the East. It was also learned that Ward Rosebush had been assigned to do specialty work on treated wrapping papers.

◆

NEW ENGLAND FREIGHT RATES

Recent freight rate or classification changes docketed by the New England Freight Association include the following: a proposal to establish as exception to Rule 30 of Consolidated Classification No. 12, an allowance of the actual weight (not over 100 pounds per car) for temporary blocking, flooring, lining, racks, strips, stakes or similar bracing, dunnage or supports, used by shippers of newsprint paper when required for safe transportation. Not less than the minimum carload weight is to be charged. This rule, long sought by newsprint shippers, will provide the similar dunnage rule applicable to other commodities.

The rate on wood pulp, not less than 40 per cent water, from Danville, Quebec, to Windsor Locks, Connecticut, is to be reduced from 34 cents a hundred pounds to 29 cents per hundred pounds. The tariff also notes a change in the minimum weight from a present 45,000 and 50,000 for rolls and non-rolls to shipments to a flat 80,000 pounds.

Representing New England paper and pulp mills, the New England Paaper and Pulp Traffic Association's traffic manager appeared before the Traffic Executives Association recently, together with members of the Pulp and Paper Traffic League, to oppose recommendations of the carrier's "Low Spot Committee" with reference to wood pulp rates. These recommendations would place wood pulp rates in official classification areas, which means 25 per cent if first class. This would mean drastic advances in many cases. The carriers would except import or intercoastal wood pulp moving to Central Freight Association territory, and would not prevent the publication or retention of lower rates made to meet motor truck or water competition. Canadian rates to American mills would be placed "in harmony with the New England adjustment."

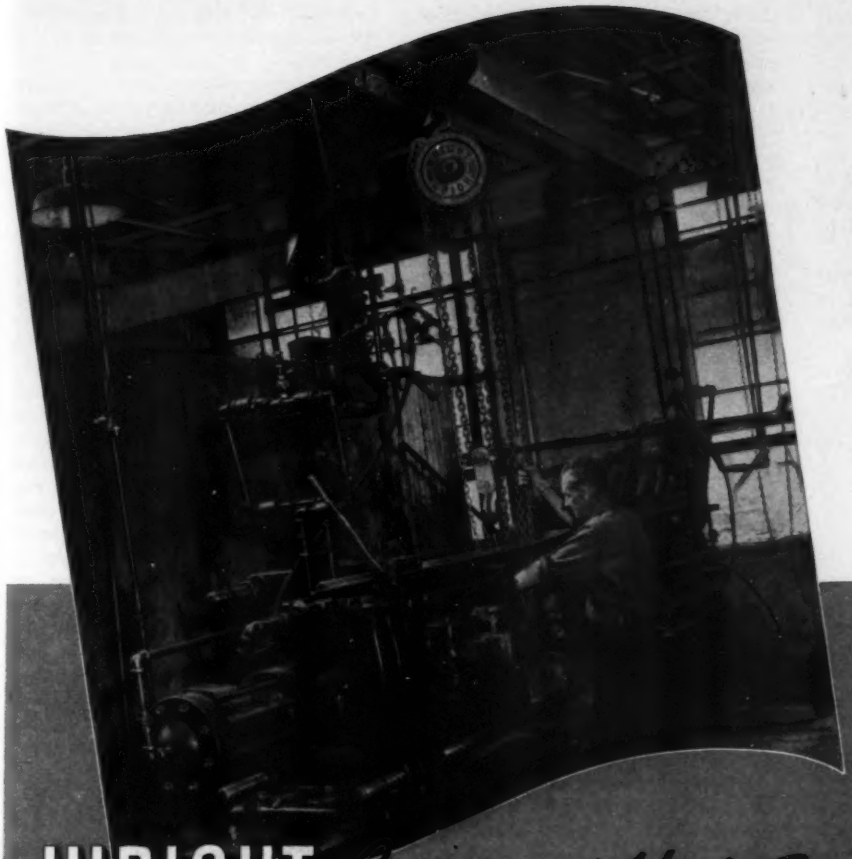
◆

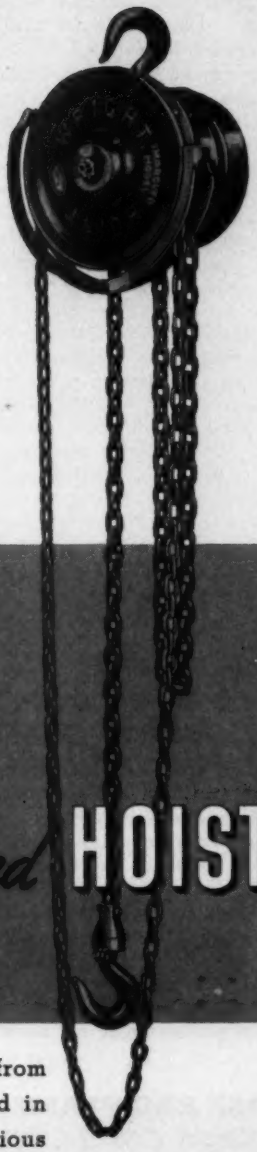
NEW PAPER CLUB MAKES PLANS FOR PAPER FESTIVAL

The newly-formed Southern States Pulp & Paper Club, made up of over one hundred executives, engineers, chemists and technicians from the principal pulp and paper mills and allied industries in the 12 Southern states, held a dinner meeting December 19 in Savannah, Georgia, to formulate plans for the forthcoming Paper Festival. Thirty-one members were present at the meeting and D. G. Moon, general chairman, outlined proposed plans and appointed committees to handle the various events.

The club held its first meeting October 15 in Jacksonville, Florida, and was organized at that time with an active membership of about forty. In addition to Mr. Moon's appointment as general chairman, it was announced that R. C. Richter was made vice-chairman and that O. W. A. Rodowski was appointed secretary and treasurer. In all probabilty, the future Southern Section of Tappi will be made up of members of this new organization.

During the Paper Festival the club will have available the various activities that have been arranged for the





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You can have a Wright Improved High Speed Hoist in capacities from ¼-ton to 40 tons, and in combination with various types of Wright Trolleys and Cranes. Send for your copy of the new Wright Catalog—a helpful manual on hoisting equipment.

BUY ACCO QUALITY *in Wright Hoists, Tru-Lay Preformed Wire Rope, Reading-Pratt & Cady Valves, Campbell Abrasive Machines, American Chains, Page Welding Electrodes and Page Chain-Link Fence.*

WRIGHT MANUFACTURING DIVISION
YORK, PENNSYLVANIA

AMERICAN CHAIN & CABLE COMPANY, Inc.

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event such as the Governor's Banquet and Formal Ball, and the Historical Pageant. Another feature that will be sponsored by the club is an educational exhibit at the Paper Products Exhibition in the auditorium. In this exhibit the club will portray the elementary phases in the manufacture of pulp and paper as well as some of the more technical developments and by products.

Arrangements for the spring meeting of the club will be handled by local committees chairmen of which are: C. C. Carpenter, technical program; H. F. McLeroy, arrangements; J. T. Wagner, registration; J. D. Robinson, entertainment; W. F. Allen, reservations; E. H. Mayo and S. W. Dodge, mill visits, and M. S. Kehler, forestry and association. Mrs. W. F. Allen is chairman of the ladies committee.

Another dinner meeting will be held by the club on February 6 when further details and features for the Paper Festival will be arranged.

◆

PARSONS DIV. OF AWP CORP. MAKES CHANGE

Changes are being made on one of the three machines at the Parsons division, American Writing Paper Corporation of Holyoke, Massachusetts, to utilize it for ledge paper production. Much of this work is now being done at the Lindin division which plant has heavy unfilled bookings ahead. The dryers at the Beebe-Holbrook plant, used as auxiliary units now, will be taken over to the Parsons division for the extra production at that plant.

◆

CHASE BAG PLANT NEARS COMPLETION

The new plant of the Chase Bag Co., Portland, Oregon, is rapidly nearing completion. J. C. Plankinton, manager of the sales bureau of the Northwestern Electric Company, has signed a contract for service to the new plant. Seventy kilowatts of lighting load and between 300 and 400 horsepower in motors will be required in the building, which will have 60,000 sq. ft. of floor space.

W. J. Austin, president of The Austin Company, Cleveland, who are the engineers and builders, is reported as saying that factors which have in general held plant improvement programs and new industrial construction in check in 1938, are fast being overcome. Marked improvement in the volume of factory building placed under contract the last few months of 1938, and the urge in many industries to modernize and decentralize, give some indication of increases in prospect for 1939.

This Chase Bag plant represents one of these indicators, in line with developments which are placing higher and higher premiums on plant efficiency and distribution economy. It is expected that the plant will be done and in operation about March 15.

◆

HOLYOKE'S NEW SEA WALL WILL THWART FLOODS

December 19 was an important day in the lives of paper manufacturers in Holyoke, Massachusetts, for it marked the start of construction of a $1,075,000 sea wall which will run along the Connecticut River and guard their plants against the ravages of future yearly floods. The dike will extend from a point at the Holyoke dam to Mosher Street as the first portion of this all-important program. The second portion will run from Mosher Street and join the present dike in the Springdale section of Holyoke.

The first 500 feet of the wall will be actually built by WPA labor under the direction of the United States Army Engineers. During that part of the construction, bids will be advertised and the remaining portion will be done by private contractors, with the U. S. Army engineers in charge. The wall will vary in height and at all points, will be higher than the 1936 flood stage which broke all records. Engineers estimate that the first portion of the wall will be more than 5,000 feet in length. The Federal Government has announced that instead of being finished by June, 1939, an extension to June of 1940 has been granted.

The start of construction brings to an end years of agitation for this type of protection. The move gained momentum after the 1936 flood which cost paper manufacturers thousands of dollars. These manufacturers threatened to move from Holyoke unless some action was taken in their behalf.

◆

C-W INSTALLS NEW DORR UNIT

The Crown-Willamette Paper Company has recently installed a new lime slaker and classifier unit in its Camas (Washington) plant which is reported to be effecting a substantial saving in lime and the elimination of insolubles. The unit was furnished by the Dorr Company of Spokane, Washington, the investment being approximately $15,000.

A rotary lime slaker and causticizer is used in connection with a Dorr washing type classifier. Impurities in the lime are first settled in the classifier, washed by a fine spray and mechanically discharged into the container by reciprocating rakes. Milk of lime, already grit free, and a portion of which is already converted into caustic soda, overflows a weir and enters the Dorr causticizing agitators, passes through them by gravity and is retained long enough to insure high conversion and causticity. What the equipment actually does, in addition to the removal of insoluble impurities, is to automatically take out the unslaked portion of the lime, by-pass it, and take the reject to the slaker for complete slaking. Nothing but completely slaked lime passes into the system.

The C-W organization is also rebuilding its Lebanon (Oregon) plant and is transferring to that plant the digester that had been used in the now abandoned Floriston (California) mill. It is expected that the pulp capacity will be increased 10 to 15 per cent as a result of the changes now in effect.

◆

DISSOLVE ABITIBI PROTECTIVE COMM.

The preferred stockholders protective committee of the Abitibi Power and Paper Company announced on December 4 the termination of the deposit agreement of June 19, 1932, which caused the committee to be constituted.

In a letter to preferred stockholders, both classes, the committee cited as reasons for the termination of the agreement, the fact that the interests who at the time of the committee's formation agreed to underwrite the latter's expense in connection therewith, had given notice of the termination of that liability. The committee saw no reasonable prospect of securing other satisfactory underwriters and due to the fact that a steady withdrawal of deposited shares had reduced the total on deposit to a level where "the protection is not sufficient to enable the committee to command an effective position in reorganization proceedings," it was impossible for the committee to carry on.

It is rumored that a new protective committee for the preferred shareholders of Abitibi may be formed shortly. According to the reports, the initiative in organizing a new committee to replace the one which has now been dissolved is being taken by interests who, it is understood, are large shareholders.

Solving a Problem in Profit

One manufacturer who came to S & W could win another market — and the profits in it — if he could produce paper from his new stock formula. There were certain difficulties to be overcome; he asked us to build him a wet machine that would insure correct formation in the vats, as well as a uniform sheet from the less expensive mix.

The machine that S & W built for this manufacturer together with the new calender feed answered his requirements, and helped him cut the loss from drying oven wrinkles to less than 1% when it had previously been 20%.

Your mill might well profit, also, by working with a consulting engineer and S & W for the building of paper machines like those listed here. Facilities are available for building Edwards, Harper, or straight types of Fourdriniers up to 130 inches wide. Without obligation, we will gladly send you more information on the machines mentioned below, if you will outline your requirements in a letter.

The SMITH & WINCHESTER

Manufacturing 1828 *Company*

ONE HUNDRED AND TEN YEARS OF ADVANCEMENT

PLANT AND OFFICES AT SOUTH WINDHAM, CONN.

Machine shop and wood room of Kennebec plant where fire started.

FLAMES SWEEP KENNEBEC PULP AND PAPER COMPANY

A SPECTACULAR fire of undetermined origin destroyed the sulphite storage plant and offices of the Kennebec Pulp and Paper Company, Augusta, Maine, on December 19, inflicting a loss unofficially estimated at $300,000. As the fire broke out in the early morning, there were no employees at work.

The fire, which burned steadily for over four hours, started in the three-story wooden storage section and, fanned by high winds, quickly destroyed the office building of the $1,000,000 plant. The wood-grinding mill was also destroyed. The flames licked their way down to the railroad tracks and engulfed two freight cars, while sparks from the conflagration fell on the nearby business district, some floating as far as the State Capitol a mile away.

Although the fire departments responded readily to the general alarm, the fire fighters were handicapped by low water pressure, resulting from a bursted water main which may have been broken when the second floor of the wood and sulphite plant collapsed under the heavy weight of water-soaked paper napkins, which were drenched when the water sprinklers started working. The fire, however, was checked before it could spread to another section of the plant housing expensive machinery. The destroyed portion of the mill formerly housed the Cushnoc Paper Company, which firm manufactured newsprint until 1935, when it was bought out and turned into a tissue towel manufacturing concern.

The plant employed 350 men and the last report stated it was uncertain as to when the mill would re-open, although Superintendent Alfred Lund stated the papermaking plant could get under way by bringing in sulphite by train.

◆

WHITE & WYCKOFF WINS AWARD FOR TALKING CARDS

Official recognition from the Associated Industry of Massachusetts has been won by the White and Wyckoff Manufacturing Company of Holyoke, Massachusetts, for its new development —"the greeting card that talks." A merit award has been given the firm.

An exclusive White and Wyckoff patent, these unique cards were first placed on the market in an experimental way last spring. The novelty lines include cards for St. Patrick's Day, April Fool's Day, Easter and the famous Charlie McCarthy cards. The White and Wyckoff firm celebrates its 50th anniversary this year.

N. E. PULP AND RAG MARKETS

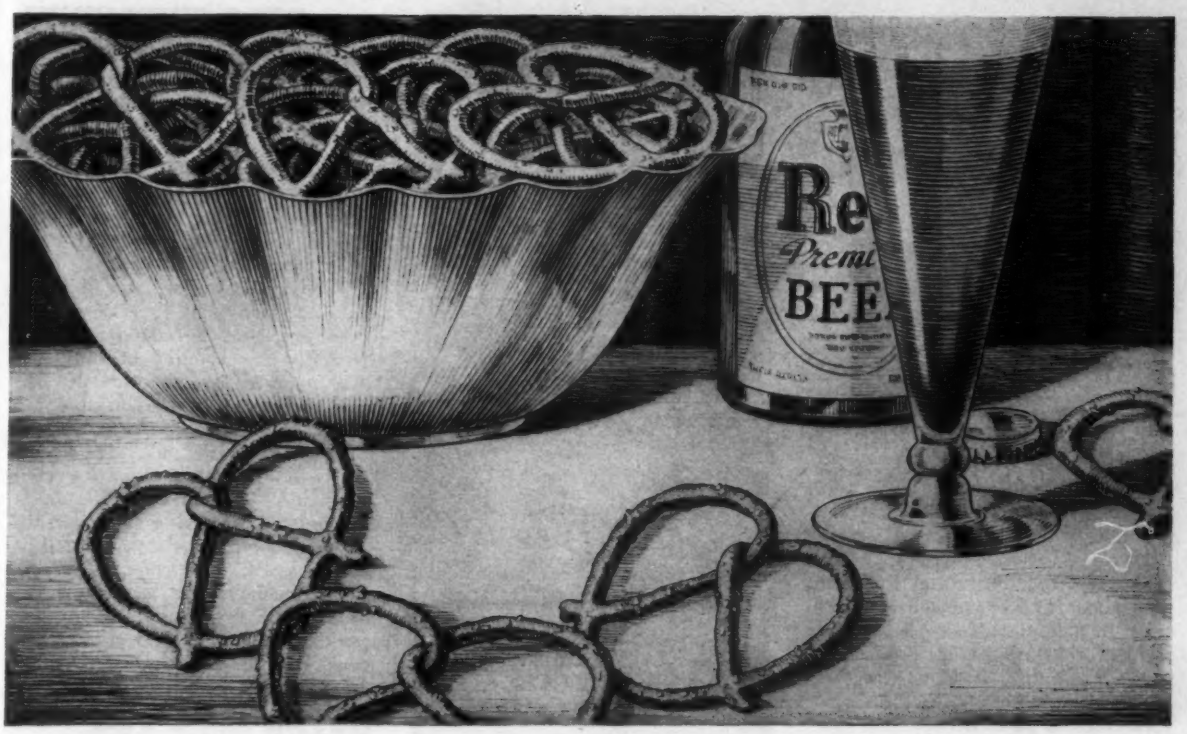
From a northeastern point of view, the uncertainties that surround chemical pulp may be partly resolved before the new year is very old. One of these is related to the inability of rayon sulphite pulp manufacturers to market their output for which these dissolving pulps were intended and the fear, which is exaggerated no doubt, that a considerable part of the capacity would be revamped to compete with strictly papermaking pulps. Of late, Japanese demand has revived on a small scale with sailings from Portland but far more important has been the home demand and the introduction of rayon products into new fields. One pulp manufacturer in New England has been discussing with a customer, the possibilities of rayon yarn as a substitute for cotton in tire fabric. If a general shift ever starts, he contends, existing rayon pulp capacity would be insufficient to take care of the consumption, which would effectually dispose of any immediate danger to bleached sulphite prices in the paper markets.

Those papermakers who have sought stable bases for estimating 1939 costs have had them provided in part at least, by the willingness of importers to guarantee delivery on bleached sulphite over the entire 12 months of 1939 at the $50 per ton ex-dock. Though domestic producers would not follow this gesture, they admit, privately, that there will probably be no change in the first six months at least.

The market was shaken a bit before the year ended by a number of distress or resale transactions, made for the purpose of cleaning out accumulations. These resulted in transactions at $35 and less on unbleached sulphite. These transactions also resulted in prices of $45 to $47 on bleached sulphite. In one respect the recent resale business did not develop any prices which had not been already quoted on contract. Importers have offered good foreign krafts at $35 dock for shipment; fair ones at $30, which is only $2 more than the lowest price on a southern kraft ex-dock northern port.

The Connecticut Valley fine paper mills, as a group, began the new year with a relatively small stock of rags but with considerable information as to just where there are enough stocks in dealers hands to maintain current operations on a hand-to-mouth basis. White or easily bleached varieties are not plentiful but by careful purchasing, most mills have not been compelled to pay higher prices in spite of the fact that they operated at capacity

INTERESTING USES OF ALKALIES . . . NO. 1



How the Pretzel Gets its Shine . . .

WHETHER you are a beer drinker or not, you are undoubtedly familiar with that appetizing tidbit — the pretzel. But how many know that its inviting brown and glossy surface comes from a bath in a solution of Caustic Soda? After the dough has been twisted by hand or stamped by machine into the familiar shapes, the pretzels are placed on wire racks and dipped in a solution of 1 pound of Caustic Soda to 20 gallons of water. They then pass under an automatic salt shaker and on into the oven. In olden times the lye used was prepared by filling an old basket with wood ashes and pouring on boiling water, which filtered through into a tub.

While the amount of Caustic Soda used in a year's pretzel production is trivial compared with even a day's consumption by the paper, soap, textile or chemical industry, this application is an interesting example of the widespread use made of this common alkali. It also serves to emphasize the importance of extreme purity — a quality which COLUMBIA Caustic Soda possesses to a degree made possible only by eternal vigilance and a deep sense of responsibility by the inspectors and all other workers in the Production Department of the COLUMBIA organization.

COLUMBIA

SODA ASH • CAUSTIC SODA • SODIUM BICARBONATE • • •
MODIFIED SODAS • LIQUID CHLORINE • CALCIUM CHLORIDE

THE COLUMBIA ALKALI CORPORATION
BARBERTON, OHIO
NEW YORK • CHICAGO • BOSTON • ST. LOUIS • PITTSBURGH • CINCINNATI • CLEVELAND • MINNEAPOLIS • PHILADELPHIA

during December. One observer believes that soft unbleached muslin is an exception to this rule. He believes that while 6½ cents bought some of these rags, others were sold for 7 cents or more, which is about the market on white shirt cuttings. The dark or fast dye cuttings are slow and plentiful. Packers have offered some lots at 2½ cents delivered to mill. This would include some fast-dye colored shirt cuttings, though the bleachable quality would bring 4 cents or better.

◆

COMPANY'S RY. IS AID TO SHIPPING

The Nekoosa and Port Edwards (Wisconsin) mills of the Nekoosa-Edwards Paper Company are shipping 59,436 tons of paper per year at the present time, an amount equal to about 2,922 cars. The mills have a daily capacity of 150 tons. Nepco is shipping about 11,662 tons of paper by truck, in addition to the other amounts, and recently inaugurated a new service between its mills known as "The Nepco Railroad." During the past year 7,447 tons of paper between the mills have been handled and distributed to the various cars of customers at either mill. This paper was formerly handled by truck.

◆

EASTERN MFG. REORGANIZATION IN FINAL STAGES

Official notices have been sent to creditors, stock and bondholders of the Eastern Manufacturing Company of South Brewer, Maine, announcing a hearing on the reorganization plan on January 24, in the Federal Court at Bangor. This will presumably be the final hearing as all committees representing all interested groups have approved the plan as presented by the Orono Pulp and Paper Company seven per cent bondholders' committee and modified on the request of stockholders.

At least 51 per cent of the stockholders and two-thirds of the bondholders must sign letters of transmittal giving their assent to the plan before the court can declare it effective. In brief, the plan would substitute lower interest rate bonds and securities for outstanding obligations. Banks would finance claims of $1,152,000 over a five-year period at 4 per cent. The joint statement of all committees expresses the belief that the plan will relieve the company of the pressure of a large current indebtedness and permit its retirement over a reasonable period. The Eastern company made a very fair profit both in 1937 and 1938 due largely to its favorable wood pulp contracts, particularly with rayon manufacturers.

◆

EVEREST ADVANCED TO PRESIDENCY

D. C. Everest, who has been vice-president and general manager of Marathon Paper Mills Company, Rothschild, Wisconsin, was made president of the company at its recent annual meeting held at the company's offices in Wausau, Wisconsin. C. C. Yawkey, who has filled the office of president of the company, is now chairman of the board, a newly-created office.

Mr. Everest is one of the most widely known executives in the paper industry. He is president of the

D. C. Everest

American Paper and Pulp Association and will preside over the meetings of that body when the sixty-second annual convention is held in New York City February 20 to 24.

Other officers elected at the Marathon annual meeting were: Leo E. Croy, Menasha, and John Stevens, Jr., Wausau, vice-presidents; P. M. Wilson, secretary-treasurer; A. M. Van Douser, assistant secretary-treasurer. New members of the board of directors are: Lester Armour, Chicago, and L. F. V. Drake, New York City.

The reports given at the annual meeting showed the affairs of the company to be in fine condition. Business showed an increase and it is expected this position will be maintained throughout the year.

RESUME RAYON PULP SHIPMENTS

After a lapse of about 7 months, shipments of rayon pulp produced in the mill of the Port Royal Pulp & Paper Company, Fairville, N. B., are being resumed. In 1937, a contract was made between that company and Japanese importers whereby 60,000 tons of the rayon pulp would be shipped from the Fairville plant to Japan, and direct by steamer from St. John, an ocean port, and of which Fairville is an immediate suburb.

The shipments were interrupted last spring by the inability of the Japanese to finance payments on the balance of the contract. This forced a long suspension of production operations at the Fairville mill. The financing is now reported as having been completed. The Fairville mill, one of the senior pulp-making entities in the eastern provinces, had concentrated on sulphite pulp until three years ago, when machinery for the manufacture of the rayon pulp was installed. The working staff numbers about 200 when at capacity production.

◆

TEACH PULP AND PAPERMAKING IN WASH. SCHOOLS

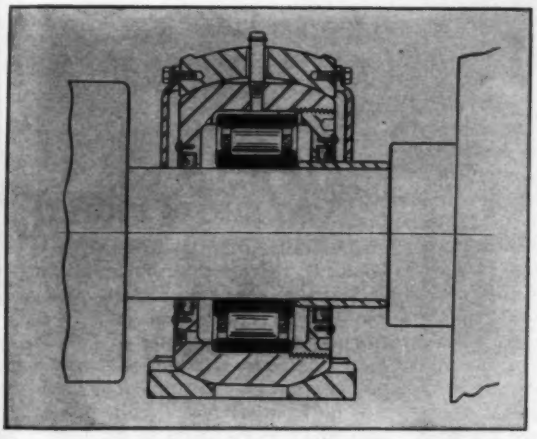
A general survey course in the manufacture of pulp and paper is now part of the regular curriculum of the vocational department of the Longview (Washington) public schools and is being presented to men employed in the three mills located at Longview; namely, the Pulp Division of the Weyerhaeuser Timber Company, the Longview Fibre Company and the Pacific Straw Paper & Board Company. Classes, which are being held each Tuesday evening, are of two-hour duration and cover all types of pulp and paper machines, steam hydraulics, piping, pumps, papermaking, dyeing, bleaching, etc. The class membership is approximately 75.

The course is directed by George McGregor, superintendent of Weyerhaeuser's Longview mill, and Carl Fahlstrom, technical superintendent of the Longview Fibre Company. Others assisting in the work are Carl Flanders, of the Longview Fibre Company, A. C. Zimmerman and Arnold Maahas, of the Pacific Straw Paper and Board Company and Edward Wood and J. H. Handley of the pulp division, Weyerhaeuser Timber Company. It is hoped that the pulp and paper course can be expanded to two or three years, which would allow a more specialized study into the special fields of pulp and paper manufacturing.

ROLLWAY *Solid Cylindrical* Bearings

on this Couch Roll

Assure smooth, even sheets of paper—



"Engineered to the Job"

Affording a load safety factor of four at the top speed of the shaft, this ROLLWAY BEARING is of the separator type, providing 16 solid cylindrical rollers ⅜" in diameter by 1¾" long. Notice the closures that seal both sides of the housing, holding in the lubricant and preventing the entrance of water which continuously drips over the pillow block in the installation for which this bearing was engineered.

Everybody knows it's the wet end of the paper machine that really determines the character of the paper. If the couch roll doesn't run smoothly, the paper is neither smooth nor even. That's why the Crocker Division of the American Writing Paper Company at Holyoke, Mass., changed this couch roll from babbitt bearings to Rollway Solid Cylindrical Bearings.

The ample radial capacity of Rollway's solid cylindrical rollers easily carry the pressure of almost 6 tons per bearing. Operation is easier. Running is smoother. Upkeep costs are lower. And less lubricant is needed. There is less danger of soiling the paper with excess lubricant—a fact further guarded against by shrouds over the pillow block and by effective housing closure which help to keep the lubricant in and the water out.

Types for every PAPER MILL NEED

Rollway's free Advisory Engineering Service will gladly assist you in selecting the highest efficiency Rollway Bearing for:

- ★ Dryer Cylinders
- ★ Jordans—all makes, front, back, outboard bearings
- ★ Felt and Wire Carry Rolls
- ★ Breast Rolls
- ★ Suction Press Rolls
- ★ Cylinder Molds
- ★ Couch Molds
- ★ Primary Presses
- ★ Main Press Rolls
- ★ Pulp Grinders
- ★ Chippers
- ★ Deckers
- ★ Slitters
- ★ Reels
- ★ Loose Pulleys
- ★ Calendar Stacks—bottom, top and intermediate rolls

ROLLWAY BEARING COMPANY, INC.
SYRACUSE, N.Y.

ROLLWAY BEARINGS

51 Years Building Heavy-Duty Bearings

UNEMPLOYMENT SECURITY AT FITCHBURG CO.

The Fitchburg Paper Company, Fitchburg, Massachusetts, announced recently that 350 wage-earning employees will be provided with a system of unemployment security of the company's own devising. Employees with five or more years of service will receive 60 per cent of their normal wages during idle periods while those who have been in the company's employ from two to five years will receive 40 per cent. The amounts advanced will be repaid by percentage deductions from salaries during normal times and following slack periods. The announced purpose of the plan was to provide for a more even distribution of income. The company is believed to be the first in New England to adopt such a system.

◆

JAPANESE ASS'N TO HANDLE B. C. LUMBER EXPORTS

A Japanese association, backed by the Tokyo Government, has been formed to handle almost all of British Columbia's lumber exports to Japan and the Japanese-dominated areas of China, it was learned recently. When the association begins to operate, it was said, all lumber exports in the Pacific Northwest, except logs for box making, airplane spruce lumber and logs for pulp manufacture, will be handled through it. Lumber shippers in the United States will also be affected, it was said.

◆

MILWAUKEE IS SITE OF NEW GAYLORD PLANT

A new plant for the manufacture of fiberboard boxes and other products is to be established in Milwaukee, Wisconsin, by the Gaylord Container Corporation, large manufacturers of corrugated and solid fiber shipping containers, paraffined cartons, folding cartons, wrapping paper and other kraft specialties. With the establishment of this plant in Milwaukee the company will be able to increase its business still further in the Northwest territory. The plant is expected to be in operation shortly. It will be located in the property of Eline's, Inc., on Port Washington Road.

It is interesting to note the fact that Gaylord Container Corporation manufactures its product in its entirety; owning its own timber lands, making its own pulp and paper, and selling the ultimate consumer. Through this system the Gaylord organization is able to have complete control, not only over all operations, but also over the quality of the finished product.

◆

STATUES FROM "HARD PAPER"

A new innovation called "hard paper" has just been developed by the I. G. Farbenindustrie, Germany's leading chemical producer. The composition is paper pulp combined or laminated with a synthetic resin and the mass pressed at a high temperature into compressed blocks.

This "hard paper" is expected to compete with stone, iron and bronze for monumental use, for it is said that under test it resists bad climatic conditions, acids and heats and that it can be worked with hammer and chisel like marble. Several well-known sculptors have tested blocks of the new material and report enthusiastically on its properties. It is of the same hardness as box-tree wood, but of far greater weight than any of the woods now used commercially.

◆

RFC MAY AID BROWN COMPANY

Reports that favorable action may be taken soon by the RFC on the Brown Company's application for a $8,000,000 loan led to favorable reaction of the latter firm's securities. Approval of the plan would probably be the last step needed to effectuate the reorganization plan, except for the formality of vote taking.

The funds would be used in part to recompense the State of New Hampshire for its advances in recent years which have enabled the Brown Company to conduct normal woods operations. The State regarded the loan in part as an employment measure. A substantial portion of the anticipated loan, however, would be used for improvements and repairs to the plant and equipment at Berlin, New Hampshire.

◆

SCOTT EMPLOYEES RECEIVE BONUSES

1,200 employees of the Scott Paper Company, Chester, Pa., received a Christmas service award December 22. Employees who joined the company before January 1, 1938, received $25 plus $1 a year for each year of continuous service. Employees who joined the company between January 1, 1938, and June 30, 1938, received $10. Those who joined the company between July 1, 1938, and December 20, 1938, received $5. Members of the company's sales organizations throughout the country also received Christmas awards.

Today more people than ever are engaged in carrying on the company's operations and in addition a program of further expansion, estimated to cost $2,500,000 is in progress.

◆

BOWATER-GOVT. PACT HIT BY TRADE GROUP

Disapproval of the Newfoundland Government's contract with Bowater-Lloyd (Newfoundland), Ltd., for the development of the Gander district was recorded on December 6 by the St. John (N. B.) Board of Trade. The Board advised adoption of such policy as would assure development of the Gander area as an industrial entity and recommended in the interim export of unmanufactured woods be permitted up to a maximum of 100,000 cords annually on short-term lease.

It was held in the resolution that the agreement was not conducive to proper protection of the country's interests in that it permitted raw wood export for an unduly long period and did not require the company to undertake "that large scale development warranted by the timber and water resources in the Gander area."

◆

MINAS BASIN CO. TO SHOW PROFIT

The Minas Basin Pulp and Power Company, Hantsport, Nova Scotia, will have an estimated profit of $100,235 by the end of its fiscal year, August, 1939, according to R. A. Jodrey, secretary-treasurer and managing director of the firm. The profit will be from its No. 1 pulp production which is marketed in the United States, a substantial quantity going to the Scott Paper Company at Chester, Pa.

The Annapolis Basin Pulp and Power Company, a subsidiary of the Minas Basin firm, is now completing a new power development on Paradise Brook not far from Hantsport. Development of about 20,000,000 kilowatt hours annually is expected. This development will be joined with the power development on the St. Croix River, already in use for the operation of the Hantsport pulp mill and pie plate annex.

PYREX brand INDUSTRIAL GLASS

HERE'S PROOF OF "PYREX" BRAND GLASS STRENGTH

"PYREX" Industrial Glassware is *not* made from ordinary glass. It is made from a boro-silicate glass with qualities which give it greater strength. And because of the low expansion differential between the opposite surfaces when subjected to heat, it can be built in the thickness required for plant operating equipment.

HERE is a typical industrial installation of "PYREX" Brand Industrial Glassware. This Bubble-Cap Fractionating or Absorption Column of 18 sections weighing nearly a ton and a half, illustrates the feasibility of translating laboratory and pilot plant work to full scale production in "PYREX" Industrial Glassware. It aptly demonstrates rugged strength and adaptability.

"PYREX" Brand Industrial Glassware is suited to a wide range of industrial applications. It is remarkably resistant to thermal shock and the attacks of all acids and alkalies in solution (except HF). If you have a pilot plant problem difficult to translate into full scale production, it will pay you to consult with a Corning Engineer.

T.M. REG. PYREX U.S. PAT. OFF.

PYREX

CORNING GLASS WORKS

CORNING N. Y.

"PYREX" is a registered trade-mark and indicates manufacture by Corning Glass Works

BRIEFS

▶▶▶ AN EXCHANGE OF MORE THAN 10,000 ACRES of property between the Quebec Provincial Government and the Consolidated Paper Corporation, Ltd., has been announced. The paper firm turned over about 5,000 acres of its property in Portneuf County for the Government's use in colonization and received in return provincial lands unsuitable for settlement but suitable for forestry development.

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▶▶▶ THE QUEBEC NORTH SHORE PAPER COMPANY is adding to its fleet, another 26-foot winch boat of welded steel construction. This is the second boat of this type which has been supplied by Russell Brothers, Ltd., Owen Sound. The boat is to be delivered at Baie Comeau.

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▶▶▶ THE LONG LAC DIVERSION, which will divert waters now flowing to Hudson Bay into the Lake Superior watershed, will be used to float logs down to Schreiber in connection with an extensive pulpwood development.

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▶▶▶ THE CARTIER WAXED PAPER PRODUCTS, LTD., manufacturers of waxed and other processed paper stocks, will soon begin the superstructure for a new one-story mill on a recently-selected site in Ste. Genevieve, Quebec. The plant is reported to cost about $60,000, including machinery.

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▶▶▶ GUMMED PAPERS, LTD., Brampton, Ontario, has completed an extension of its plant of 3,000 square feet of floor space. The plant will have an increased capacity of 25 per cent.

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▶▶▶ THE PENINSULAR PAPER COMPANY, Ypsilanti, Michigan, recently issued earned bonus checks amounting to about $2,000 to employees. Each employee received $1.50 for each month of employment during 1938.

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▶▶▶ IT IS WORTH NOTING that despite the unfavorable results generally, two New England companies were able to pay bonuses to all employees. The Spaulding Fibre Company of North Rochester, New Hampshire, paid $30 a person to 400 workers and Bird and Son of East Walpole, Massachusetts, paid a percentage bonus based on previous six months wages.

▶▶▶ THE KVP COMPANY OF TEXAS, an affiliate of the Kalamazoo Vegetable Parchment Company, is now established in Houston and, according to reports, has already begun initial operations. Although the Texas plant will undertake some manufacturing, the bulk of the operations will be of a converting nature.

◆

▶▶▶ IMPROVEMENT OF THE NEWSPRINT SITUATION is expected by Harold S. Foley, vice-president of the Powell River Company, Powell River, B. C., who stated that conclusions of the company's directors in respect to newsprint stocks had been substantially correct, i. e., that publishers' stocks were now approaching normal and that reasonable increase in production by manufacturers seemed possible in the near future.

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▶▶▶ LESSONS ON BLEACHING have been started at the Port Edwards mill of the Nekoosa-Edwards Paper Company with 24 members in attendance. The lessons are under the direction of J. F. Natwick of the Wisconsin vocational bureau, who is conducting a series of similar classes on the various phases of papermaking in the mills of the Fox and Wisconsin River valleys.

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▶▶▶ THE RFC HAS ANNOUNCED A LOAN OF $1,700,000 to the Fox River Paper Company of Appleton, Wisconsin. Other paper loans in addition to the latter, included $3,425,000 to the Southland Paper Mills; $25,000 to the Apex Paper Box Corporation, Chicago; $125,000 to the Boston Envelope Company, and $25,000 to the Famous Paper Box Company, New York City.

◆

▶▶▶ THE AMERICAN WRITING PAPER CORPORATION of Holyoke, Massachusetts, has installed a new Southworth moistening machine and Foxboro recorder. This new machine has been added to the Riverside division of the company. The machine adds moisture to the paper and can also equalize the moisture in the paper. All of the pasted paper is hung in this moistener and is aerated to assure its lying flat.

▶▶▶ AN APPROPRIATION OF $500,000 for the establishment of a chemical plant at Bonneville Dam, Oregon, to manufacture chemicals for use in fighting the spread of noxious weeds on western farms, will be asked of Congress by an Oregon representative, it was reported recently. It is said that $500,000 would provide a plant capable of producing about 6,000,000 pounds of sodium chlorate annually.

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▶▶▶ THE ST. CROIX PAPER COMPANY, Woodland, Maine, recently completed the re-building of its No. 3 Machine, another step in the firm's improvement program. There have been many major improvements made in the plant during the last six years.

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▶▶▶ PAPER BAGS FOR POTATOES are being made at present by the Hollingsworth and Whitney Company. Several other new products are being made by the Maine paper firm, it is rumored.

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▶▶▶ A FOREST ACT AMENDING BILL will permit the Powell River Company, Powell River, B. C., and Pacific Mills, Ltd., Oceans Falls, B. C., to use timber from each others' limits. This bill does not allow the two companies to take more timber than they now can under license but would permit one to take timber from the other—a convenience when one firm cuts timber it cannot use.

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▶▶▶ THE PHILIP HANO COMPANY of Holyoke, Massachusetts, has embarked on an expansion program in which more than $150,000 will be spent before the end of 1939.

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▶▶▶ PROMINENT IN THE PAPER INDUSTRY, A. P. Woodson, president of the Bay West Paper Company, Green Bay, Wisconsin, has been elected to the board of directors of the Employers Mutual Liability Insurance Company of Wausau, Wisconsin. Mr. Woodson is also president of the Mosinee Paper Mills Company at Mosinee, Wisconsin.

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▶▶▶ A $2,000,000 WORKS PROGRAM for Northern Ontario, which will provide for highway construction and forestry conservation, was agreed upon in principle at a conference held in Ottawa during December. The project is designed to cope with unemployment caused by a sharp drop in pulpcutting operations.

POWER PLANTS AND PAPER MILLS

Proper planning ahead for improvements, extensions, or new plants, in 1939, will require plenty of time for the best results. An early start will help to determine what you ought to do; how much it will cost; and how long it will take to do it. We design, build, and equip complete Paper Mills and Power Plants. Our specialists have many years of experience, and extremely practical outside viewpoints. They are immediately available to discuss your plans with you. Our preliminary suggestions will be made quickly, carefully, and cheerfully, without cost or obligation to you, if you will communicate with our Cleveland or New York office.

The H.K. Ferguson Co.

ENGINEERS AND BUILDERS

CLEVELAND, OHIO • HANNA BUILDING • PHONE CHERRY 5870 • NEW YORK CITY • 25 WEST 43rd STREET • PHONE BRYANT 9-7257
SAN FRANCISCO • 58 MAIN STREET • EXBROOK 5059 • TORONTO, CANADA • 1221 BAY STREET • KINGSDALE 3646 • MEXICO CITY • MEXICO

Back to page 40, Aunt Matilda...

we're not ready for you yet

Question: When "show-through" from page 40 jumps in and spoils the reading on page 39, who's called on the carpet?

Answer: (We can hear you say, "Don't be silly; you know very well it's the paper manufacturer.")

But actually now, is there really any excuse for a printing paper that isn't opaque? It's so easy . . . and so economical . . . to eliminate "show-through" with Krebs Pigments . . . and to help even the thinnest of papers take sharp, easy-to-read printing on both sides of the sheet.

Try Krebs Pigments . . . even under the stiffest conditions. See how much whiter, brighter and more opaque they make your paper. Here's the first step: Write right now for whatever information you need.

Krebs Pigment and Color Corporation, 1007 Orange Street, Wilmington, Delaware.

KREBS white and colored pigments

★

SIAMESE
"TOUR BOSS"
DRYER FELT

Patent applied for

Makes friends fast

A BETTER PRODUCT for you at LESS EXPENSE to you

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"EXACTING ENGINEERS PREFER POWELL STEEL VALVES"

1500 POUND
WELDING END
GLOBE VALVE
SPUR GEAR OPERATED

1500 POUND
WELDING END
GATE VALVE
WITH BY-PASS
AND MOTOR OPERATED

Powell steel valves have made a definite mark in the engineering world for greater efficiency in low and high pressure control equipment. Write for detailed information regarding your particular problem!

POWELL VALVES

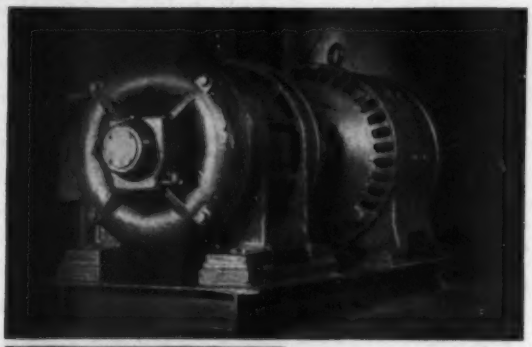
THE WM. POWELL CO. CINCINNATI, OHIO

CUT 3.72¢ PER TON FROM
PAPER MILL
LUBRICATION COSTS
● PLANT LUBRICATION costs in a Wisconsin paper mill averaged 14.32c per ton in 1935. In 1936 this dropped to 13.75c. In 1937 it was 11.88c. Today, lubrication for the whole plant, including power generation, averages 10.6c per ton. What helped bring about this 26% reduction? Standard Lubrication Engineering Service!
There's no mystery about it. This cost-reducing service offered by Standard is an engineering service like that provided by your architect, equipment manufacturer or consulting engineer (alike, except that Standard Oil Engineering Service costs you nothing). Engineers with specialized training in lubrication lend their experience to your organization, applying tested lubricants and methods to your lubricating problems. Your maintenance and lubricating costs determine its value to you.
Have your Standard Lubricating Representative explain fully just what this Engineer can do for you.
Copr. 1939, Standard Oil Co. (Ind.)
STANOIL
HELPED MAKE THIS SAVING
TANDARD OIL COMPANY (INDIANA)
...LUBRICATION ENGINEERING...LUBRICATION ENGINEERING...LUBRICATION ENGINEERING...LUBRICA

G...LUBRICATION ENGINEERING...LUBRICATION ENGINEERING...LUBRICATION ENGINEERING...LUBRICA

THE RIGHT LUBRICANT PROPERLY APPLIED

Reduces Costs for These Manufacturers



STANOIL

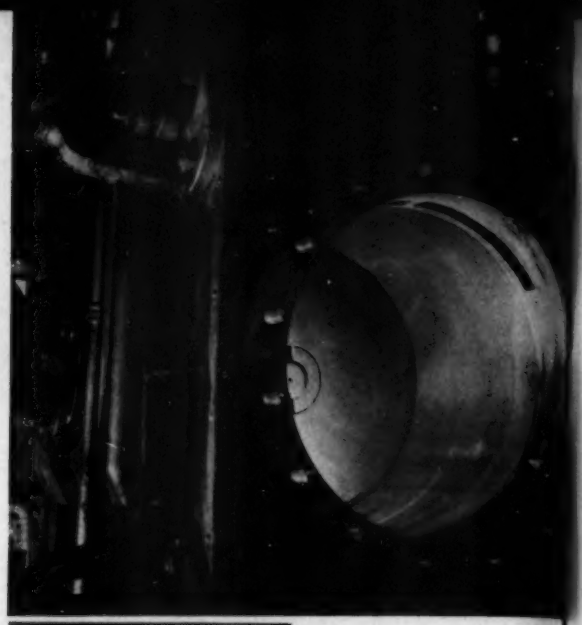
A motor generator set was burning out bearings because of sudden weather changes, even though summer and winter oils were used. The chief electrician found that one grade of Stanoil used the year 'round stopped weather guessing, ended bearing troubles.

SUPERLA GREASE

A conveyor manufacturer thoroughly tested several brands of grease before entrusting the roll bearings to the protection of Superla Grease. The higher viscosity oils in Superla and its freedom from separation even after long periods of service were some of the deciding factors in favor of Superla.

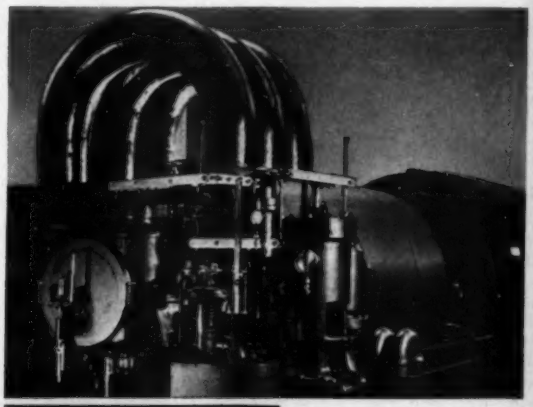
NEW **DEVELOPMENT IN LUBRICATION**

A booklet describing the latest development in lubrication is just off the press. A development that enables you to use one brand of oil to replace up to 27 specialized brands now in use *and do a better lubricating job.* Find out what this new idea might mean to you in reduced lubricating and maintenance costs. Ask for the booklet "Spare the Time to Spare Your Machine." Write Standard Oil Company (Indiana) 910 South Michigan Avenue, Chicago, Illinois.



STANOCYL

The superintendent of an industrial power plant could not get his Corliss engine to pull its rated load. Examining the cylinder he found it scored and dry although ample oil had been fed to the engine. A Standard Lubrication Engineer recommended StanoCyl W, an oil for use under wet steam conditions. Now the engine pulls a full load and there's no more scoring.



NONPAREIL TURBINE OIL

Governor driving gears on a turbine in a southern public service company power plant were being replaced every 6 to 8 months. In an attempt to overcome the difficulty Nonpareil Turbine Oil was installed. That was 6 years ago. A recent inspection showed this 6-year-old set of gears to be in perfect condition. The same fill of turbine oil is still in use.

Standard Lubrication Engineers are located in 29 offices throughout the middle west. There is one near your plant ready to help you with any lubrication problem and to help you get more for your lubrication dollar. This service is free if your plant is in any of the 13 states shown above. Write Standard Oil Company (Indiana) 910 S. Michigan Ave., Chicago, Ill. for the Engineer nearest you.

Allis-Chalmers Timken Bearing Equipped "SSOR" Paper Stock Pumps as installed in Grays Harbor Pulp and Paper Co.

Tapered Roller TIMKEN BEARING EQUIPPED

A symbol of quality for any piece of equipment with which it is associated

10 to 13 Years of Service Original TIMKEN Bearings Still Good For More

Pictured above are several Allis-Chalmers Timken Bearing Equipped "SSOR" Paper Stock Pumps at work in the Grays Harbor Pulp and Paper Company's Mill, Hoquiam, Washington. These were installed in 1929. The original TIMKEN Bearings in them are still on the job and apparently good for many more years of trouble-free service.

As a matter of fact the original TIMKEN Bearings used in the oldest pumps of the "SSOR" line, those built by Allis-Chalmers in 1926, 13 years ago, are still giving efficient service. The same is true of hundreds built since that time.

TIMKEN Bearing performance not only on Allis-Chalmers Pumps but on all kinds of paper making equipment is what we refer to when we say, "It pays to buy Timken Bearing Equipped paper making machinery of all kinds."

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

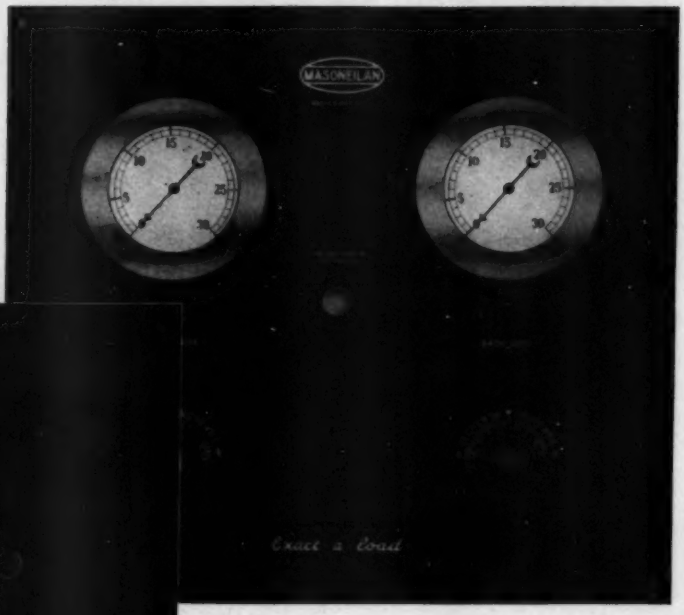
Manufacturers of TIMKEN Tapered Roller Bearings for automobiles, motor trucks, railroad cars and locomotives and all kinds of industrial machinery; TIMKEN Alloy Steels and Carbon and Alloy Seamless Tubing; TIMKEN Rock Bits; and TIMKEN Fuel Injection Equipment.

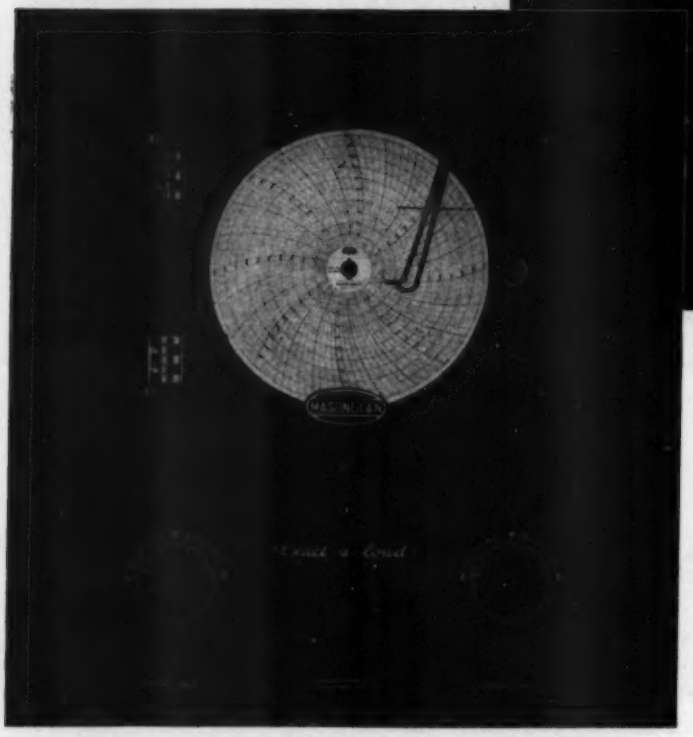
TIMKEN

TAPERED ROLLER BEARINGS

Now! Exact-a-load Control

WITH BUILT-IN DUAL ACTION





FEATURES:

Large diaphragm load-adjusting valves for very sensitive, accurate control.

Compact, rugged unloading valve with push-pull action.

On manual or automatic unloading, air supply to diaphragms (or cylinders) is shut off—and only diaphragm pressure exhausts to atmosphere. There is no venting of operating air supply.

There is no continuous bleed of air; air is used only when diaphragm pressure changes.

Either recording type or indicating type available.

Above, right — Indicating Exact-a-Load Control Panel.

Above, left — Recording Exact-a-Load Control Panel.

Exact-a-Load, which gives you precise roll load control, now has an additional function. Where required on such applications as press, squeeze, lump-breaker and similar rolls, Exact-a-Load may provide for alternate loading and *lifting* of the roll. The system is simple, built-in and positively interlocking; it is impossible for its dual functions to operate simultaneously.

If you are not yet familiar with Exact-a-Load Control write for Bulletin PD-102 and supplementary data on double action.

MASONEILAN **1196 ADAMS STREET, BOSTON, MASS., U. S. A.**

New York Buffalo Philadelphia Pittsburgh Chicago Toledo St. Louis Tulsa Houston Los Angeles

Every knock is a boost — to Tellurium Lead. This lead thrives on punishment — actually develops increased toughness under stress. *It work-hardens.* When rolled, hammered or stretched, it actually becomes stronger. As a result, turnover points and joints are less subject to cracking.

Furthermore, where vibration occurs, this capacity to develop latent strength minimizes buckling and creeping. And when heat changes are frequent and rapid, Tellurium Lead gives improved resistance to fracture.

The other outstanding advantage of Tellurium Lead is this: It gives increased resistance to sulphuric and other corrosive acids, even at temperatures that tend to approach the melting point of the metal. In plant after plant, it has prolonged the useful life of equipment . . . and reduced the number of shut-downs for repairs.

Tellurium Lead of our manufacture is time-tried St. Joe chemical lead alloyed with a small quantity of tellurium. It gives the advantage of this well-known chemical lead plus important new ones. Yet now, it costs only a fraction of a cent more per pound than chemical lead. Available in sheets, pipe and coils. For further facts, write to nearest branch.

Typical User Reports

"I wish to say that your Tellurium Lead pipe has proved all you claimed. It is easy to weld and easy to flange. Also the flanges stand up a good deal better than ordinary lead as they seem to actually become stronger at the turn-over point."

Another company writes: "We lined one of our tubs with your Tellurium sheet lead. After eight months, the lining shows very little if any corrosion due to the action of the 10% boiling sulphuric acid. It promises to have a much longer useful life than the lead previously used."

NATIONAL LEAD COMPANY

New York, Baltimore, Buffalo, Chicago, Cleveland, Cincinnati, St. Louis; National-Boston Lead Co., Boston; John T. Lewis & Bros. Co., Philadelphia; National Lead & Oil Co., Pittsburgh; Georgia Lead Works, Atlanta; The Canada Metal Company, Ltd., Toronto, Montreal, Winnipeg and Vancouver.

FOR MAXIMUM OPACITY

RAYOX

PURE TITANIUM DIOXIDE

VANZYME
An Enzyme For Converting both Raw Corn and Tapioca

R. T. VANDERBILT CO. INC. RAYOX TITANIC PIGMENT PRODUCTS

McNAMEE CLAY
Low Grit and Low Abrasion

R. T. VANDERBILT CO., INC • 230 PARK AVENUE, NEW YORK

Editorial ★ ★ ★

FORECASTING THE NEW YEAR

▸▸▸ FORECASTING THE PROSPECTIVE TONNAGE business for the paper industry presents no problem this New Years Day because the forecasts of general business volume for the coming year all agree, with singular unanimity that the general trend will be upward by a substantial percentage. The fact is that the outlook is for a return to former normal figures for the first time since 1929. Some of the national forecasters are on record that even "the sharp peaks of 1929 may be topped." The predictions are based on population growth, new products, deferred demand for goods, expenditures for armaments, pump priming, the building boom already under way, and the return of confidence in the soundness of our business methods and the determination of American business men to bring business back to normal.

What the theoretical normal business for 1939 is, no man can yet say. For since our last year of normal business, we have added some thirteen to fourteen millions of consumers to our population, all seized with the determination to not only live up to the standards of American consumption, but demanding additional comforts and conveniences that only American living standards provide for American consumers.

To us, the outstanding factor in the business equation for 1939 is the new psychology, which since the mandate of November, has swept this country like a beneficial downpour on a parched plain. The defeatist attitude has gone. Business men now know that no more artificial curbs on natural expansion nor punitive policies by Washington politicians can prevent their progress.

The November election came too late in the year to be of material benefit to 1938 volume. But the intervening time of some sixty days did permit general business to make the necessary readjustments so that immediately following the turn of the year, general business would be geared to start 1939 off on its most successful career since the pre-depression period.

So, in every hamlet, in every town, in every city, in every county, in every state in this puissant commonwealth, every business man has a new hope, is seized with a new determination to do his level best to carry on so that as a result of this improved, released psychology, 1939 will be the outstanding year of the past three-quarters of a generation.

We cannot remember a year in the last generation when we have gone into the new year with such an overwhelming majority of all the determinable factors for good business, on the plus side.

No man, no set of men, no politician nor group of bureaucrats can prevent the tide of predetermined business success from coming in. It is on the way. There is but one thing to do—move with the tide.

For the paper industry, volume business stands assured. We went into 1938 with a volume approximately 40 per cent of capacity. We go into 1939 with a volume approximately 80 per cent of capacity. But, when tons of paper products are taken into consideration, the amount exceeds anything in the history of the industry due to the fact that in the past two years, the capacity of the industry has grown to the neighborhood of a million tons of all classes of paper and paper products. What would have happened had mill capacity not been thus augmented is an interesting speculation. It is a certainty that all the production will be required to fill the forthcoming demand in the next two years in which any further expansion of capacity will be comparatively negligible.

Prices of paper in 1938 dropped to the lowest figures since 1932 while the shipments in most divisions exceeded any volume ever experienced. The maintenance of volume demand and a substantial increase in unit value of paper products is the expected program for 1939 in the paper industry.

The movement of the incoming tide foreshadows better earnings. Hence, we hail 1939 with a hearty welcome!

◆ ◆ ◆

WAGES

▸▸▸ SEVERAL REFERENCES WERE NOTED recently in the literature of the industry relative to the wages of papermakers in mills of England and America before the days of machine-made paper. Such figures permit some interesting comparisons with the wage situation of the industry today.

An English papermaker, for example, during the latter part of the fifteenth century was paid from two to three shillings a week for his labor. By the early part of the eighteenth century a vatman in an English mill was earning from fifteen to eighteen shillings a week; while toward the end of the century Thomas Houghton of Andover, Mass., in writing to his former home in England, commented, after expressing the wish that he had some English workmen with him, "The wages is a great inducement; for good ones, used to writing paper in every stage we would give fifteen shillings per week and board, or fifteen shillings per week and an addition equal to board."

Published statistics of the U. S. Department of Commerce reveal a wage expenditure for the pulp and paper mills of the country that totaled $173,077,781 for 1929, as contrasted with a similar expenditure of $53,245,639 in 1914. Of the $173,077,781 spent by the industry for wages in 1929, $140,398,374 went to paper mill wage earners and $32,679,407 to wage earners in pulp mills. The average number of wage earners for the year, according to the same statistics, totaled 128,049 for the entire industry, 103,320 of the total being associated with paper mills, the remaining 24,729 with pulp mills.

Another tabulation of the U. S. Department of Commerce shows an increase of approximately 32 per cent in the average weekly earnings of pulp and paper mill employees over the five-year period, 1932-1937. Figures as given in the tabulation are as follows: 1932, $18.79; 1933, $17.97; 1934, $18.74; 1935, $20.56; 1936, $22.33; 1937, $24.75.

A comparison might also be made of the hours of labor of the early papermakers as contrasted with those of today; but that is another story.

The lesson which might be drawn from both stories, however, can be summed up in one word, PROGRESS.

CURRENT THOUGHT

"DAWN OF A NEW DAY"

WILLIAM SIBLEY

ACCORDING to the imminently capable publicity forces of the New York World's Fair, January 1, 1939, ushered in the "dawn of a new day." Not only in New York City, but in many spots throughout the entire nation, the late George Gershwin's song "Dawn of a New Day," was struck up at the stroke of twelve New Year's Eve, thus establishing it as the theme song of the New York World's Fair. Gala "Dawn of a New Day" parties were held in hotels, night clubs, restaurants and homes throughout the country. Simultaneous blazing of hundreds of "Dawn of a New Day" electric signs, and the lighting of the huge Trylon and Perisphere atop the Times Square skyscraper, were features of the midnight celebration in the Broadway area, while on Fountain Lake in the Fair Grounds, more than one hundred thousand people witnessed a sixty-minute display of spectacular fireworks ending in a mass of fiery letters proclaiming the "Dawn of a New Day."

All of which, of course, is most largely just grist for the Fair's publicity mill. But, by the same token, much of the insistence that 1939 has ushered in a "new day," is in my opinion truly prophetic. "World's Fairs" regardless of where or when, have been signally successful in focusing national attention on the technologist, and, through the technologist, we have found ourselves constantly on the threshold of several "new days." As instances:

▶▶▶ The first Philadelphia fair, held in 1876, made that giant Corliss engine the talk of the nation. It *was* a huge affair, having a vertical cylinder some three stories high. And, for the period in which it operated, it was perhaps the most efficient steam engine yet devised. That engine, and the Corliss principal of converting steam into power, did tremendous service to the nation by bringing closer to realization the adaptation of steam power over the then almost universal use of water power.

▶▶▶ Another advent of unmeasured benefit to mankind which was hastened by means of a world's fair was the furthering of electricity through the publicity afforded by the Columbian Exposition in Chicago in 1893. Following that exposition electricity rapidly came into its own—through the first electric train at Menlo Park, through the manufacture and swift adoption of electric street cars, and through the general adaptation of electricity to both commercial and domestic purposes.

▶▶▶ From the St. Louis exposition there came about an entirely new conception of both architecture and interior decoration. That fair did much to get the nation away from the ornate gingerbread in architecture and the red plush and horse hair upholstery, and settle us on lines which were straighter, simpler, more efficient. Without our knowing it at the time that fair, practically speaking, ushered in the era of "stream-lining."

▶▶▶ Again in Chicago, the World's Fair of 1933 gave tremendous impetus to the development and perfection of air conditioning—an industry which, not too far removed from the present day, will grow to a size comparable with the automotive industry.

▶▶▶ What will be the largest single lasting good to come from the New York World's Fair no one of course can recognize now. Nor perhaps for several years. But, in the writer's opinion, there will surely emanate from that fair many things of deep-going social importance if only because the fair will again emphasize to everyone the importance of the engineer, the chemist, the physicist, the technologist.

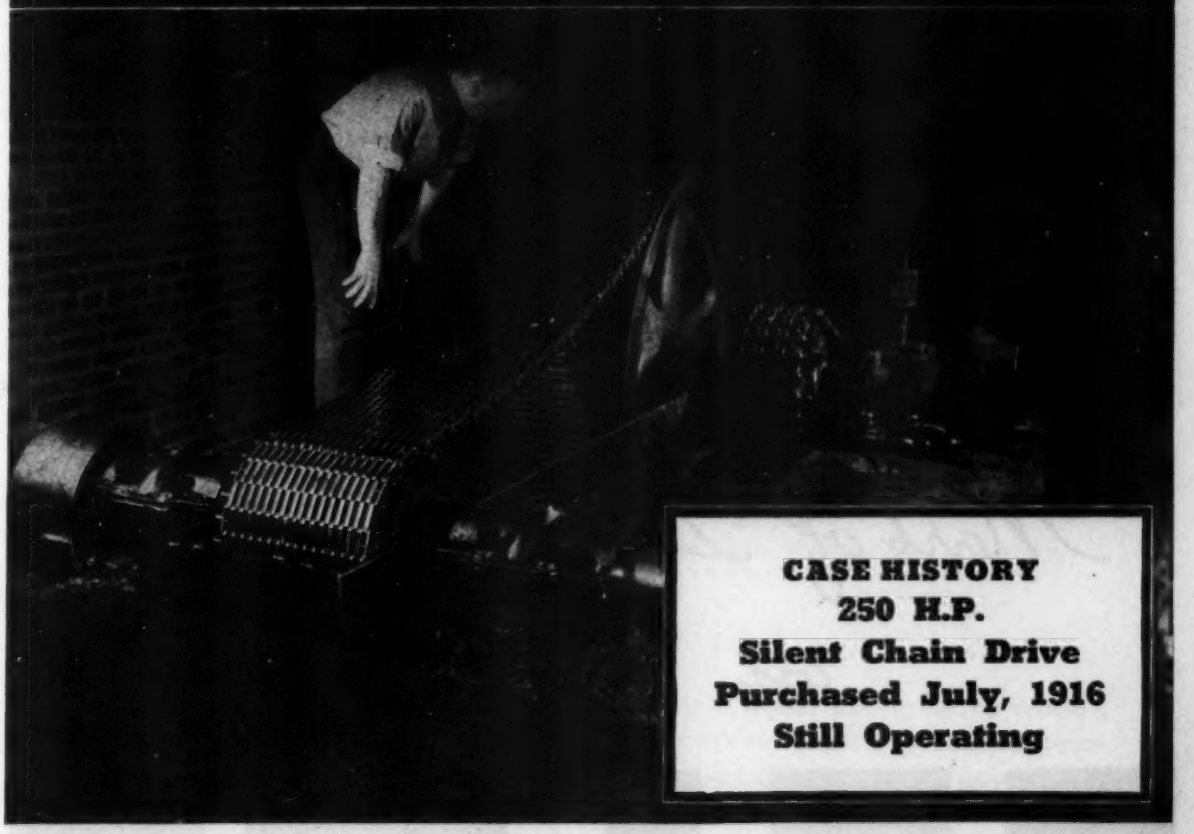
If there is any one member of society who can most largely benefit mankind it is the scientist. And if there is any one member of society whom we should carefully watch just out of sheer self-protection it is the scientist. We see at world's fairs examples of his work and progress, but his work and his progress continue far beyond the closing of such fairs. And it is highly important that we keep abreast of his work.

▶▶▶ Right today, a newsprint mill being erected in the South may have a far-reaching effect on American paper and pulp industry. Members of our industry living in Canada will probably not like to hear of a newsprint development in our own South, but that development is not an impossibility. The one mill now being built may presage the advent of many more such mills and so some of our Canadian friends may become victims of the scientist as we become the beneficiaries.

Many mills know the bitter problem presented by foam. Right now there is one mill which is fabricating a highly efficient insulation board—using foam as a vehicle in its production. In this single example, not to speak of the scores of specialty products now being developed from cellulose, is found the truth of the publicity phrase "1939 to be the Dawn of a New Day."

"The Dawn of a New Day" is just another way of saying that this is the Age of Change. The far-reaching changes now taking place every day everywhere are making yesterday's practices and last year's methods subject to immediate and drastic change. At no time in history has it been more imperative that we keep thoroughly informed of present day developments. Whole industries rise with the rapidity of the sun. And, by the same token, whole industries presently find themselves with no market. This is the age of change. To make progress, we must be ready and willing to *change*.

SILENT CHAIN PERFORMANCE FACTS



CASE HISTORY
250 H.P.
Silent Chain Drive
Purchased July, 1916
Still Operating

REPAIR PARTS COST ONLY $3.19 PER YEAR
—here's proof of amazing cash savings!

● When it comes to long life and low maintenance expense there is no other type of drive that can even approach the efficiency of the Link-Belt Silverstreak silent chain drive. It requires practically no attention and little upkeep. Definite proof of this is illustrated above—the chain drive shown has been operating steadily for 22 years and has required in all that time a total repair cost of only $70.00, which figures a mere $3.19 per year. Think of this the next time you buy a "drive." Get your money's worth—specify Link-Belt Silverstreak Silent Chain Drives! Send for Data Book No. 125, also for books on any or all of the Link-Belt positive drives illustrated below. Link-Belt Company, Indianapolis, Chicago, Philadelphia, Atlanta, San Francisco, Toronto. Branch offices and distributors located in all principal cities.

7305-B

1939
NEW YORK WORLD'S FAIR EXHIBITOR METALS BLDG.

LINK-BELT
SILVERSTREAK SILENT CHAIN DRIVES

LOOK FOR THIS

Mark of Quality

on

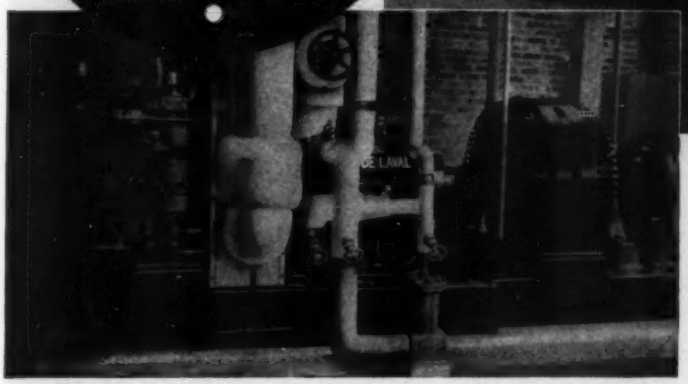
FELTS

Design . . . . . Finish
Service . . Uniformity
. . . Dependability . . .

APPLETON WOOLEN MILLS, APPLETON, WIS.

POWER
AS A BY-PRODUCT of a WASTE PRODUCT

850 kw. main geared turbo-generator unit, for extraction and condensing service.



170 kw. standby geared turbo-generator unit, for back pressure service.

THE Heywood-Wakefield Co., Gardner, Mass., said to be the World's largest manufacturer of seating equipment, makes most of its steam by burning wood waste and a large part of its power by passing this steam through

DE LAVAL STEAM TURBINES

The steam is generated at 275 lb. gage, with 200° F. superheat, and during factory hours is used for heating over 26 acres of floor space in the buildings, for wood bending and for the dry kilns at 10 lb. gage. The main turbine is designed for extraction and condensing operation, while the standby turbine is for back pressure operation. Powdered coal can be burned to supplement the wood waste and a tie with the local power company is maintained through a bank of transformers, but ultimately most of the electricity required will be generated without cost for fuel. Modern high steam pressures and special De Laval turbines for balancing heat and power loads make possible the generation of power at unprecedentedly low costs. Many instructive examples are given in our Publication E-1169, which will be sent upon request.

3510

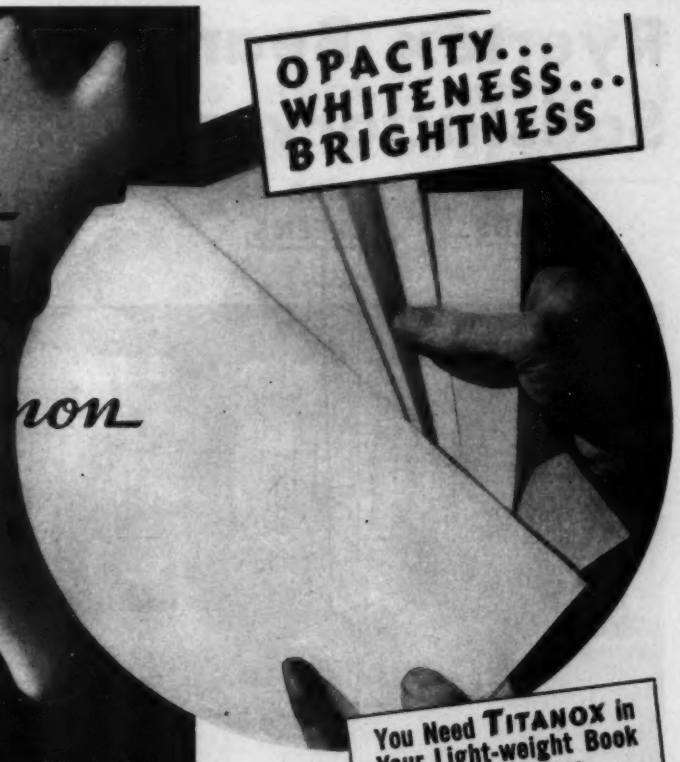
DE LAVAL *Steam Turbine Co.*
TRENTON, N. J.

MANUFACTURERS OF STEAM TURBINES, PUMPS – CENTRIFUGAL, PROPELLER, ROTARY DISPLACEMENT, CENTRIFUGAL BLOWERS AND COMPRESSORS, WORM GEARS, HELICAL GEARS, HYDRAULIC TURBINES AND FLEXIBLE COUPLINGS • • • SOLE LICENSEE OF THE BAUER-WACH EXHAUST TURBINE SYSTEM

Norton Pulpstones give you higher quality pulp - improved finish - and, by reducing sulphite content, lower costs.

Norton Company
Worcester, Mass.

The Printer and YOU have a common problem.



OPACITY... WHITENESS... BRIGHTNESS

CONSIDER the printer faced by the problem of covering black or a deep color with brilliant white. What does he do? He uses ink pigmented with TITANOX, a derivative of titanium, because he knows that such an ink will give complete opacity.

Paper makers have a similar problem...light-weight stocks which must be opaque, white and bright. How can you best produce these qualities? By using TITANOX pigments as a beater addition, thereby eliminating show-through and increasing the printability of the sheet.

TITANOX pigments afford an economical means for developing opacity, whiteness and brightness. They produce such qualities to a degree never obtainable with older pigments.

TITANIUM PIGMENT CORPORATION
Sole Sales Agent

111 Broadway, New York, N. Y.; Carondelet Station, St. Louis, Mo.; National Lead Company (Pacific Coast Branch), 2240 24th St., San Francisco, Calif.

You Need TITANOX in Your Light-weight Book Stocks to Improve Readability...

A *Chemical Curiosity* MAKES GOOD

TITANOX has definitely "arrived" as the modern pigment for making paper stocks opaque, white and bright. Thus a product which was a chemical curiosity when first offered twenty years ago now has become the dominant opaque white pigment of the paper industry.

Why this success? First, because of the inherent qualities of TITANOX pigments. Second, because their makers, who were first to develop and distribute titanium pigments, have gained knowledge through long years of research and experience, which enables them to produce pigments exactly suited to specific conditions and to advise wisely regarding their use.

The knowledge thus gained is fully available to paper makers who seek to meet the modern trend of opacity, whiteness and brightness.

Our service department welcomes inquiries on technical problems

TITANOX

TITANOX TRADE MARK

Ryertex Bearings Proved Highly Satisfactory on . . .

SHAKE BOARDS
BIRD SCREENS
WIRE ROLLS
TABLE ROLLS
DECKEL PULLEYS
PRESS and COUCH ROLLS

● Ryertex Bearing installations in the Paper Mill industry are numerous and varied, and all installations are characterized by definite financial savings and highly efficient operation.

Ryertex Bearings are moderate in initial cost and necessitate no radical change in housing when they are installed to replace bronze and babbitt liners.

Another advantage of Ryertex Bearings lies in the use of water as sole lubricant. Besides saving the expense of oil lubrication, this feature promotes cleaner felts and consequently cleaner stock.

Ryertex Bearings have a low co-efficient of friction (approx. 1/3 that of Babbitt) and will not wear the shaft. This results in longer bearing life and definitely lower power consumption. They have high compressive strength and the ability to withstand shock loads; also a great resistance to acids.

In addition to the applications indicated above, Ryertex Bearings are used on bleachers, jack-ladders, conveyors, grinders, digesters, log-hauls, slashers, drum barkers, beaters, screens, knotters, bark presses, chippers, chip crushers, deckers, refiners, etc.

Let us send you complete data. Write for bulletin 32.

Joseph T. Ryerson & Son, Inc. Plants at: Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Boston, Philadelphia, Jersey City.

RYERSON

"Drying in a Paper Mill is as much a matter of ventilation as of heat."

Mill Ventilating Systems

Need Modernization

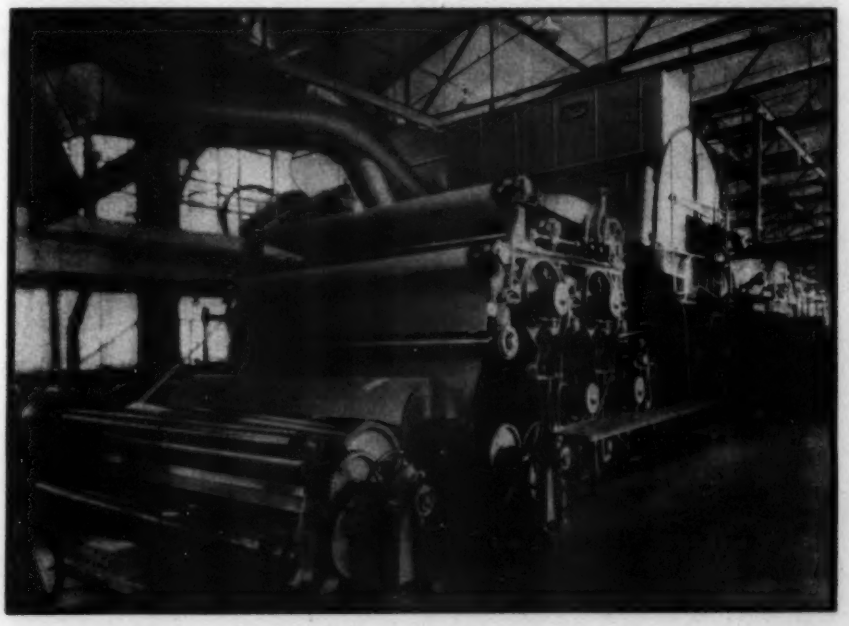
FRED MERISH

NOWHERE is there a greater demand for continuous, uninterrupted production than in a paper mill. Because of the necessity for drying paper in process, adequate ventilation is most important.

An observation of many paper mills, which was part of a survey conducted in the field of industrial ventilation, revealed that of the paper mills inspected, 70 per cent use some form of obsolete or inadequate ventilation, resulting in decreased production, higher costs, inferior output, excessive spoilage, illness and discomfort for workers, disrupted production and delayed shipments because of employees being on sick leave.

Ventilation in the paper mill serves two basic purposes: (1) the general aeration of working spaces to purify the air contaminated by breathing; and (2) the removal of industrial fog or other obnoxious discharges of processing.

Indirectly, ventilation affects profits and should be checked carefully by mill superintendents. The horse-and-buggy ven-



This illustration shows a ventilating system used by one paper mill on its Yankee dryer.

tilating systems used in many mills should be modernized.

Modern ventilation for a paper mill is of six basic types:

1) Gravity roof ventilators (not power driven).
2) Fan ventilators without ducts.
3) Vapor absorption or exhaust ventilating systems.
4) Industrial fog eliminators with ventilating fans.
5) Variable temperature heaters to supply fresh air at predetermined temperatures for ventilation, or to replace air displaced by mechanical exhaust systems, thus preventing a vacuum being formed in the building.
6) Air filtering and dust collecting systems.

Ventilation in summer is often handled efficiently by gravity operating roof ventilators or fan ventilators placed in walls or on roof, sucking out the vitiated air, fumes or vapors, fresh air coming in through opened doors or windows. During the winter months, however, there must be proper co-ordination between the ventilating and heating systems or the results will not measure up to standard efficiency. In the survey referred to, a lack of this co-ordination was found to be responsible for much annoyance and expense in paper mills. Too often an efficient ventilating system is checkmated by an inadequate heating system, or an adequate heating system does not function efficiently because the ventilation is below standard.

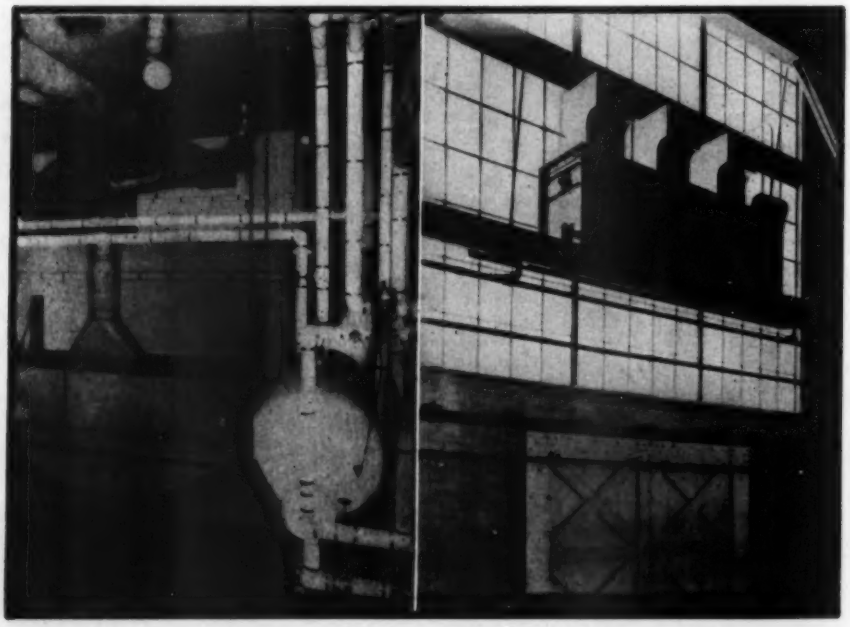
In 80 per cent of the mills inspected, fans or blowers were the mechanical devices operating the ventilating systems. It is advisable to check these power devices regularly for cleanliness and efficiency. Fan trouble caused by dirt, dust, fumes and vapors entering motors and bearings is harmful and costly. Where fan ventilators without ducts are used for exhausting, they should be designed so that a strong wind does not blow back the air into the plant. This condition was found in some mills where a portion of the air exhausted returned to plague the workers with drafts and spotty temperatures. All ventilating fans should be protected with adequate guards, otherwise, they are a serious hazard if installed within easy reach of workers, which is often the case. Such guards should provide easy access for cleaning without removal of the protecting devices.

Where exhaust ventilation with ducts is used, consider the location of the motor. Too often it is hidden inside the ducts, inaccessible, subject to moisture or noxious fumes detrimental to efficient operation. Mill superintendents have reported that considerable motor trouble has been eliminated and repair bills cut by placing the mechanical equipment outside of the ductwork.

Exhaust ventilating systems in some mills suck in annoying infiltration of cold air, which rushes in through opened doors, cracks, crevices and around window clearings to replace the air discharged. This creates discomfort for workers and decreases efficiency. In a poorly insulated or poorly constructed mill, forced infiltration is extremely severe. To remedy this condition, unit heaters are used in many mills to offset the drafts and to provide an even temperature by means of adequate air circulation from a fan operating with the heater.

A number of mill superintendents revealed that their exhausters functioned badly in cold weather. Investigation disclosed that in an effort to maintain workable temperatures, little or no air was admitted to the buildings or rooms and the exhaust systems were choked—they could not get air. The variable temperature unit heater is the modern solution to this problem. Attached to a duct extending outside the building and equipped with recirculating dampers, this heater brings fresh air into the building as needed and warms it simultaneously, thus preventing a vacuum being formed in the building and maintaining efficient operation of exhausters. In one mill, a blast coil was installed in a window frame, thus serving as an effective vacuum breaker. By means of this coil, which tempered the fresh air supply as it came through the window, the exhaust fans were saved from air starvation.

In some mills, it was found that heating systems which had been adequate before exhausters were installed were not operating efficiently because they had not been equipped to heat the replacement air properly; consequently, the buildings were cold, unevenly heated and drafty. One reason for the lack of co-ordination between heating and ventilating systems is that exhausters and other ventilating devices have been added from time to time to meet changing conditions but the heating systems have not been improved. Obsolete radiation or pipe coils were noticed frequently on this survey. Inefficient heating equipment of this type will nullify the efforts of the most efficient ventilating system. Of late, a number of mills have adjusted this deficiency with unit heaters, which maintain even temperatures with forced circulation of air. In some parts of a mill, where the cubical air content per worker is high, where no exhaust systems are needed for processing and natural infiltration is adequate for



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Left—Dust collecting system to cleanse air of atmospheric or processing dust.

◆

Right—Unit heaters may be placed anywhere in a plant.

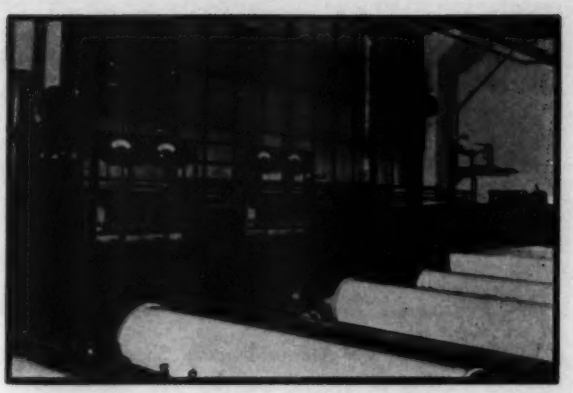
◆

ventilation, unit heaters without ventilating devices may suffice because the units may be placed so that they offset drafts and other bad effects of natural infiltration.

Drying in a paper mill is as much a matter of ventilation as of heat. A vapor absorption system will increase the output of a paper mill by facilitating the drying operation, permitting the machine to be operated at greater speed. An increasing use of modern vapor absorption systems in paper mills was noted, and superintendents have reported very favorably on the benefits from their operation. Some vapor absorption systems utilize hoods and ducts; in other cases, industrial fog eliminators or unit heaters co-ordinating with ventilating fans supply the proper quantity of warmed, dry air at the right temperature to absorb vapors and to provide bodily comfort for workers, the moisture-laden air being removed with fans.

The warmer the air, the more moisture it can hold. If ventilation is inadequate, the moisture-laden air absorbs as much as it can, then unloads, producing condensation, drippage from walls, uncomfortable, perspiring workers. Condensation is particularly troublesome in winter where parts of a plant are colder than others. The resultant condition, uneven temperatures, is found to be extremely acute where obsolete heating systems are used. Such a plant may be compared to a cold pitcher on a hot day. Hot vapors coming in contact with cold ceilings and walls do likewise, particularly where the buildings are badly insulated.

The control of process dust is an aid to ventilation. With hoods or enclosures provided at the source, the dust is carried away as generated through ducts for salvage or disposal; while the cleaned air is recirculated throughout the interior or expelled outside. The re-use of the same filtered air has decreased heating costs as much as 30 per cent for users.



Window ventilators aid in the maintenance of comfortable working areas.

The collection of paper dust and other particles from processing is an adjunct to modern ventilation. Atmospheric dust, such as soot, offers a ventilation problem, particularly where high grade writing and printing paper is manufactured. Air filters have been introduced successfully in paper mills to purify the air and to cleanse it of such dust.

Modern ventilation in a paper mill combines many factors and various devices. Application differs with the mill. Installation should be made only after a competent survey. From extensive field research on heating and ventilating, there is no hesitation in recommending that paper-mill management give more thought to this important phase of production. The modernization of obsolete or deficient systems will increase profits.

COST OF POOR PACKING

W. F. SCHAPHORST, M.E.

EVERY user of packing on paper mill machinery knows that it is one of the many things that cause a certain amount of trouble, especially when it must be removed, or when a rod or shaft must be turned down smooth on account of scoring. Otherwise, it is seldom given a thought and the same kind of packing is frequently used over and over, often at a considerable money loss.

A simple test can be made easily to determine the friction of a given packing in order to compare it with the friction of any other. This test, of course, should be made on a new and unscored shaft.

To make this test, first, pack the stuffing box of a centrifugal pump with packing No. 1, just tight enough so that there is no leakage. Then disconnect the pump from the motor or engine, and rig up a crank of some kind so that the shaft can be turned by hand. This crank must have a measured distance, in inches, from the center of the shaft to the point of application of the pull necessary to revolve it, and the direction of pull must always be at right angles with the crank arm. Rotate the shaft slowly, and by means of a pair of spring balances determine the pull required, as closely as possible, in pounds. Experiment with it until such a reading is obtained. Next, do the same thing with Packing No. 2.

Invariably one packing will cause more friction than the other. The packing that creates the least friction, to be sure, is the most desirable.

This test can be continued from time to time until the packing of minimum resistance is found. Subtract the minimum pull from the maximum, both of which should be in pounds; multiply by the length of the crank arm in inches, then by the number of revolutions made per minute by the pump, and divide the product by 63,100. The answer is the horsepower loss due to poor packing.

For example, suppose the pull with packing No. 1 in place is 10 pounds; and with the packing No. 2, 4 pounds. The difference, therefore, is 6 pounds. If the length of the crank arm is 12 inches and the revolutions per minute of the pump are 600, then

$$\frac{6 \times 12 \times 600}{63{,}100} = 0.685 \text{ hp. loss.}$$

On the basis of a $50 cost of a horsepower per year, the cost of power lost by the pump due to poor packing would be $50 $\times$ 0.685 = $34.25.

It is plain, then, that a considerable money loss may lurk in packing methods year in and year out. Buy the kind that seals effectively, and at the same time causes the least friction drag.

The Centrifugal Pump . . .
And Its Maintenance

PART I—DESIGN AND EFFICIENCY

CURT WEIL

A WELL-KNOWN pump designer once said that in order to design a good centrifugal pump for the pulp and paper industry, it is necessary to study very thoroughly the subject of hydraulics and then to forget all about it before proceeding with work of designing, since the design of a centrifugal pump is based on 10 per cent theoretical knowledge and 90 per cent practical experience. Experience of the past fifteen years, however, eliminate much of the guesswork of yesterday. From this experience has come a theory of improved centrifugal pump design which antiquates many of the pumps still in service, because of their inefficiency.

Pump Design

The centrifugal pump is a machine which forces the material being pumped to revolve within it. Centrifugal force increases the velocity of this material as it moves along from the eye of the impeller to the periphery and, by an increase in the cross section of the flow passage in the casing surrounding the impeller, the added velocity head is converted into pressure head, thus causing flow. This pressure is a function of the impeller diameter and the speed at which the impeller revolves.

Figure 1 shows the vanes of an impeller on which velocity diagrams at three different points are indicated. It is obvious that the material flowing through the passages between the vanes has a different flow condition relative to an observer outside of the pump than it has relative to the revolving impeller. The velocity of the material relative to the stationary observer is called the absolute velocity; that relative to the rotating impeller, the relative velocity.

The absolute velocity (V) at different points is found by the vectorial addition of the relative velocity (W) and the circumferential velocity (C). In other words, W and C are forming parallelograms, the diagonals of which are represented by the absolute velocity (V).

The path of the material being pumped relative to the impeller is along the contour of the vane from P to A. The vane tip lies in the direction of the relative velocity $W1$ under the angle $\beta 1$ to the circumference of the circle at this point. The same holds true for the end of the vane in the direction of $W3$ under the angle $\beta 3$ to the circumference. To avoid entrance shock losses, it is necessary that the combination of the absolute entrance velocity $V1$ with the circumferential velocity $C1$ give a direction of the relative entrance velocity $W1$ equal to the direction of the first vane element.

The path of the material being pumped relative to the stationary surroundings, represented from P to B, starts at the entrance in the direction of the absolute velocity $V1$ under the angle α_1 and ends at the circumference in the direction of the absolute velocity $V3$ under the angle α_3. Accurate determination of the contour of the vanes requires consideration of both the number of vanes and their thickness.

In designing the contour of the vane, the general procedure is to figure the eye diameter, the outside diameter, the entrance angle and the exit angle (the sizes of which depend on pump capacity, head, and r.p.m.), and then to draw a logarithmic curve from the outside diameter to the eye for the respective angles. This curve represents the approximate shape of the vane.

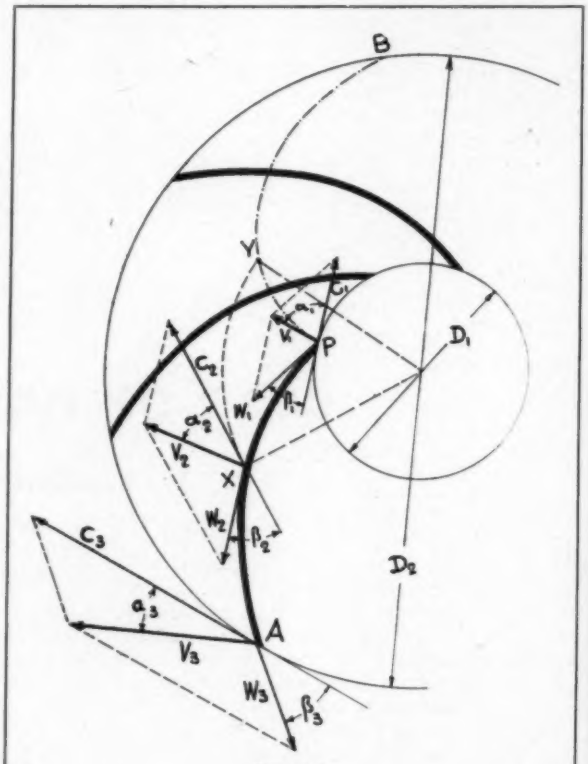


Figure 1

KEY

C = Circumferential speed of a point of the impeller
V = Absolute velocity of the liquid
W = Relative velocity of the liquid
α = Angle between C and V
β = Angle between W and negative C direction

The specific speed of an impeller gives an indication if that impeller should be used for a certain head and capacity at a given speed to obtain maximum efficiency. According to the Standards of the Hydraulic Institute, this speed is the revolutions per minute at which a geometrically similar impeller would run if it were of such a size as to discharge

one gallon per minute against a head of one foot. The formula for its calculation is:

$$N_s = \frac{\text{R.P.M.} \sqrt{\text{G.P.M.}}}{H^{3/4}}$$

The metric system and the British foot pound system also are used for the calculation of specific speed. In the case of the metric system, it represents an impeller which would discharge 75 kilograms per second against a head of one meter; while in the British foot pound system it represents an impeller which would discharge 550 pounds per second against a head of one foot.

The disadvantage of obtaining different specific speeds in calculations involving the three different systems and especially because of the latter two methods in which capacity is figured in seconds and revolutions in minutes led D. Thomas to introduce a dimensionless expression for specific speed. Specific speed, according to the Thomas expression, is the angular velocity of an impeller which does the effective work (1) in the time (1) against a head (1) with a liquid of the specific weight (1) at the gravity value of the earth velocity (1). Up to the present, however, this method hasn't been widely used in calculating specific speed.

Through the use of specific speed as a means of classifying pumps, it is possible to distinguish fast runners, normal runners, and slow runners. From the formula which has been given for its calculation, it can be seen that the larger the capacity of a pump and the smaller its head, the higher its specific speed at a given r.p.m. It also should be stated that the larger the ratio between the inside or eye diameter and the outside diameter of the impeller and the ratio between the width of the impeller at the entrance and the outside diameter, the greater is the specific speed. Likewise, the larger the entrance angle of the vane, the greater the specific speed. In other words, the entrance or suction velocity must increase with the specific speed. In addition, the smaller the exit angle of the impeller, the smaller the number of vanes and the conveying surface of them.

From such design characteristics it is possible to distinguish the radial flow impeller (a slow runner), the mixed flow impeller (a normal runner), and the axial flow impeller or propeller (a fast runner) at their corresponding maximum efficiencies.

The most frequently used impeller for ordinary liquids is the straight vane or radial flow impeller (Figure 2). Such an impeller cannot always be made to theoretical design. The revolutions per minute and the capacity to be handled in a unit of time put certain limitations on both its diameter and width. Oversizing, for example, might cause turbulence or too great friction losses. When made too wide, the liquid being pumped might free itself from the vanes and be recirculated within the impeller thus causing considerable loss in efficiency. Likewise, if higher revolutions per minute are required, the vanes become too wide for its length.

The mixed flow impeller (Figure 3) is used frequently for such installations as require higher operating speeds. It also seems to be taking the place, more and more, of the straight vane impeller in pumps which are serving as conveyors.

The vanes of a mixed flow impeller are very similar in shape to the blades of a Francis turbine. Entrance edges of the vanes are almost in axial direction and then turn in radial direction. Such a design feature greatly smoothens the change in direction of the liquid being pumped from the axial entrance to the radial exit, thereby reducing losses.

A propeller having an axial entrance and an axial exit (Figure 4) is used where large quantities of liquid have to be handled against a low head. The use of such a propeller for agitating purposes would be a typical application.

Depending on the liquid to be pumped, an impeller is commonly made either of cast iron, bronze, steel, or an alloy. The periphery of an impeller and the bore of the hub are accurately machined; while the vanes and contour of the hub are usually hand-filed to a template. The more accurate the hand-filing, the higher the efficiency of the pump. Most important, however, is the static or dynamic balancing of the impeller. An unbalanced impeller, especially with a high-speed pump, will cause vibration of the shaft, a condition which not only will ruin the shaft bearings and impeller in a very short time, but also will make it impossible to keep packings tight. In consequence, there is a decrease in efficiency and an increase in maintenance costs.

The impeller discharges into the volute, a spiral casing with increasing cross sections, which usually are in proportion to the volume of the discharged liquid. In this way, average velocities in every section are kept constant. This arrangement, however, is not the most accurate since the pressure, because of the centrifugal force of the liquid particles which are flowing with a circumferential component, must increase from the inside of the volute to the outside; and, in consequence, the velocity must decrease. Hence, the more the cross section of the spiral increases in radial direction, assuming that flow conditions on the impeller circumference are the same, the more the average velocity of each cross section of the spiral decreases. The flow in the impeller must remain steady in order that all passages between the vanes can function most efficiently. In other words, the discharge from the impeller must be kept free from shocks; the flow of liquid in the spiral must be axial symmetric.

Figures 5a and 5b show a volute casing and its cross sections at an angle of 45 deg. In most cases, these cross sections have a circular shape. A more triangular shape, however, is to be recommended where highest efficiency is vital because it has lower friction losses as well as lower losses due to turbulence. Both the contour of the volute, where friction losses are considered and corrections made

for them, and the theoretical contour, where friction losses are not considered, are shown in Figures 5a and 5b.

Pump Efficiency

The design of the impeller and volute, to the greatest extent, determines the efficiency of a pump. This efficiency is the ratio of the energy converted into useful work to the energy which was supplied. In other words, the power

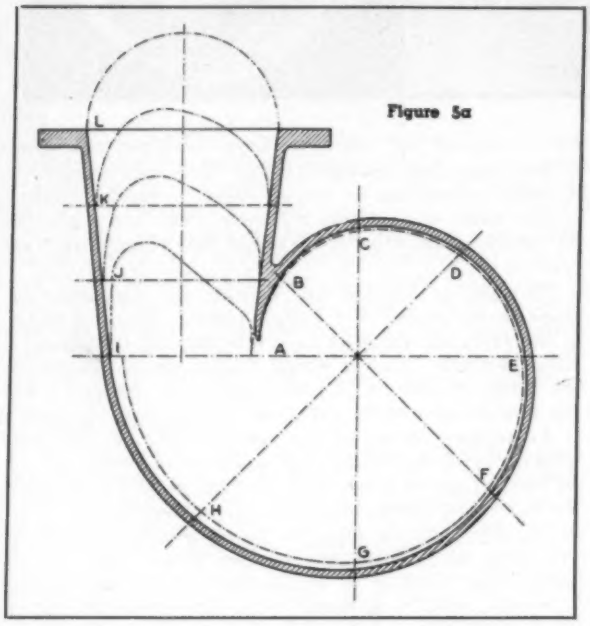


Figure 5a

requirements of a pump are equal to the stored or potential energy in the lifted liquid plus the energy consumed in overcoming losses.

The most important losses occur in the passage of the liquid through the pump. These losses are due to friction, to cross section changes, and to flow direction changes. While the pressure losses due to pipe friction are considered in the required total head against which the liquid has to be pumped, the losses between the suction and discharge nozzle (the hydraulic losses in the pump itself) are not considered. These losses, due to the impact of the liquid on the vanes of the impeller and the reduction of flow area because of the thickness of the vanes, can be figured very similarly to pipe friction losses.

The influence of the number of vanes and of the impeller diameter is not yet so well understood. A small number of vanes would seem to decrease friction losses. The guidance of liquid, on the other hand, is less effective with a small number of vanes, resulting in higher friction losses due to turbulence and inner friction losses of the liquid.

Under ordinary conditions, the number of vanes should be kept as small as possible and yet sufficient to guide the liquid satisfactorily. Empirically derived formulae make it easy for the pump designer to determine the right number.

Consideration also must be given to the impeller diameter and to the width of impeller in order to minimize friction losses. If the revolutions per minute are not fixed, the impeller diameter can be chosen so that the losses are smallest. Generally, the losses are smallest, when the diameter is as small as possible. The decrease of impeller diameter, of course, makes it necessary to increase its width so that it can handle the required amount of liquid to be pumped. Yet this width cannot be made unduly large or turbulence will occur and the liquid will free itself from the vanes and flow back to the suction side, a decrease in efficiency again.

Other losses are due to the friction between the sides and circumference of the impeller and the surrounding casing. Machining of these parts decreases the incident losses considerably. Finally, there are the losses in the volute due to friction and flow direction changes.

To the hydraulic losses must be added volumetric losses, which are composed largely of leakage through the stuffing box and recirculation of the liquid through the impeller and the casing, and mechanical losses, which are due to friction in the bearings and stuffing box.

A classification of pump efficiencies resulting from a consideration of all these losses includes hydraulic efficiency, volumetric efficiency, inner efficiency, mechanical efficiency, and total efficiency. Hydraulic efficiency is the ratio between the actual pumped head and the theoretical, calculated head; volumetric efficiency is the ratio between the actual pumped capacity and the calculated capacity; inner efficiency is the ratio between the energy in the lifted liquid and the energy put into the liquid; mechanical efficiency is the ratio between the inner energy and the energy put into the shaft; and total efficiency is the ratio between the energy in the pumped liquid and the total energy put into the pump.

The pump manufacturer makes a pump sufficiently large to compensate for any decrease in capacity and head due to wear; and guarantees it for a certain capacity and head. A pump buyer, therefore, should be very precise in supplying the manufacturer with necessary data so that the right pump for a specific job can be supplied.

A concrete example might illustrate the importance of accurate data: A mill orders a pump with a maximum capacity of 5,000 g.p.m. against a total head of 40 feet. Characteristic curves of this pump, a set of which are usually sent to the customer with the proposal, are shown in Figure 6. These curves show the relationship between capacity and head, capacity and efficiency, and capacity and power requirements. Such pump characteristics depend entirely on the design of the pump and on the accuracy of machining. They are different for each type of pump.

The power curve of Figure 6 shows that the impeller is of the radial flow or straight vane type because this type

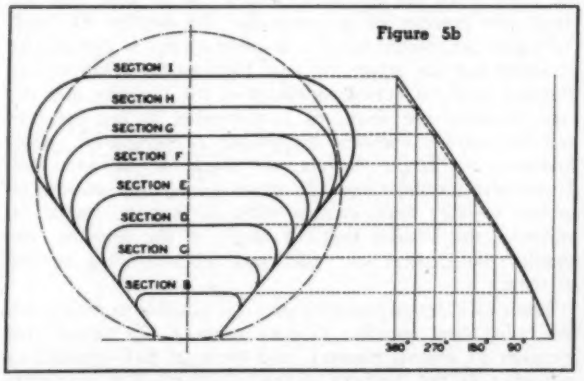


Figure 5b

of impeller has an increasing power curve with increasing capacity. On the other hand, a mixed flow impeller usually has a straight power curve; and an axial flow impeller or propeller a decreasing power curve.

After installing the pump, supplied for a maximum capacity of 5,000 g.p.m. and a total head of 40 feet, it is found that the total head is only 30 feet. At this rating (see Figure 6), the pump delivers 6,100 g.p.m. with an efficiency of only 82 per cent. In order to get the right amount of liquid, the operator is forced to throttle the discharge valve.

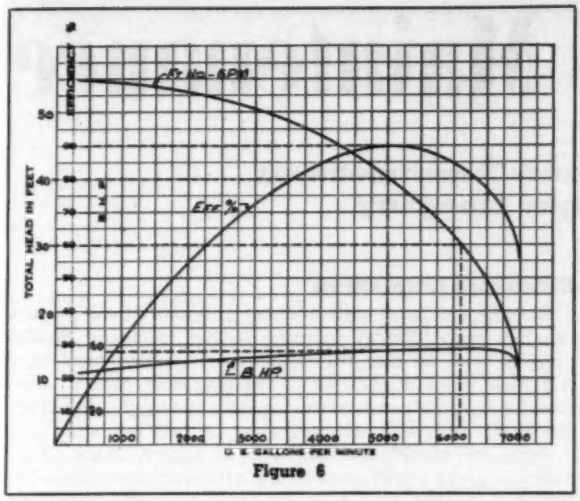


Figure 6

The wastefulness of this practice is revealed by the following calculation:

$$\text{Hp. of purchased pump} = \frac{5000 \cdot 40}{3960 \cdot 0.90} = 56$$

Motor efficiency = 90 per cent
Therefore, hp. input = 62 = 46.5 kw.
Assuming 1 kw-hr. cost 1 cent
To pump 1,000,000 gallons would cost

$$\frac{1{,}000{,}000 \cdot 46.5}{5{,}000 \cdot 60} \cdot 1 \text{ cent} = \$1.55$$

Yearly pumping cost (300 days) = $3,348

If the mill had ordered the right pump, a pump with a maximum capacity of 5,000 g.p.m. against a 30-ft. head and with an efficiency of 90 per cent, the annual power cost would be $2,500.

$$\text{Hp.} = \frac{5000 \cdot 30}{3960 \cdot 0.90} = 42$$

Motor efficiency = 90 per cent
Therefore, hp. input = 47 = 35 kw.
Assuming 1 kw-hr. cost 1 cent
To pump 1,000,000 gallons would cost

$$\frac{1{,}000{,}000 \cdot 35}{5{,}000 \cdot 60} \cdot 1 \text{ cent} = \$1.165$$

Yearly pumping cost (300 days) = $2,500

The mill, therefore, is wasting $828 a year on this pump alone. Considering the large number of pumps in operation in a mill, it is quite obvious how much money is thrown away if necessary attention is not given to their proper selection.

A pump of greater capacity than actually required will wear out much faster than one of the proper size. This increase in the rate of speed of wearing out is due to the fact that the pump will not be supplied with the amount of liquid for which it is designed. It will be filled partly with liquid and partly with air, gases, vapors, etc.

Such a pump will run noisily—the noise varying from a light crackling to the sound of rattling tin cans. Sometimes the noise becomes unbearable for the operator. This phenomenon, not yet completely understood but often observed in pumps which are pumping black liquor from evaporators, is known as cavitation.

The destruction of impellers by cavitation, by pitting, and by erosion is probably due to the fact that the liquids being pumped do not follow the curvature of the impellers. They pull away from the vanes on account of the lower pressures at the spaces occupied by air or gases and impact against the vanes again at points further away from the low pressure areas. These impacts are quite strong and as a result they cause erosion.

To the impacts also are added vibrations which cause a still faster destruction of the impellers.

Conditions of this kind can be remedied by cutting down the impellers or by decreasing the speeds of the drivers. In such cases, it is advisable to consult the individual manufacturer of each pump in question.

The illustrations that appear with this article were supplied through the courtesy of Warren Steam Pump Company, Inc.

Part II of Mr. Weil's article will appear in an early issue of this magazine. In the second part of the article, the author covers Construction, Installation, and Maintenance.—*Editor's Note.*

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MACHINES-JOBS-ADVERTISING

MACHINES have been in the limelight pretty much recently, and there has been a good deal of misleading talk about them. One fallacious notion about machines is that they cut down the amount of employment—that greater use of machines in industry means a smaller number of jobs.

It is important that we know the truth about this, for without question machines have deeply affected all industry and its individual wage earners. The facts show that besides making life easier for working men, machines also create new opportunities for employment and actually increase the total number of jobs. In this process, advertising is a very important factor.

About the time of the American Civil War, our industries began to change from neighborhood shops with hand labor to the modern factory system, equipped with machines run by power. From the very beginning of this movement there were always some people raising the cry that machines put men out of work. But that has not happened, for the simple reason that machine-made goods were sold at lower prices, more people bought them, and more men were employed.

Shortly after the Civil War, the amount of mechanical power used to operate machines in American industries was only 1-1/10 horse power for every wage earner. Sixty years later, there was 4-9/10 horse power per wage earner. As a result, the amount of work turned out by each man rose so rapidly during this period that the value added by manufacture increased from $658 per wage earner to $3,600. In other words, the mechanical power used in industry increased more than four-fold per worker, and the output per worker increased more than five-fold.

And in the meantime, what happened to employment? In the same period, the population of our country increased 3-1/10 times and the number of persons gainfully occupied increased 3-9/10 times. As industry substituted machines and power for hand labor, the productivity of each worker increased and the number of jobs increased faster than the population. During this same period, the annual earnings per worker were multiplied by nearly 4½.

When we think of this tremendous progress it is well to remember that the greatly enlarged output of industry does not automatically find a market. One of the most important factors in distributing the ever-increasing volume of goods is the use of advertising, without which this mass distribution would be impossible. In a way, advertising is really a key to our industrial progress. Many industries owe their growth directly to the power of advertising.

The machine age means more things for more people and advertising is its indispensable tool.—*Bureau of Research and Education, Advertising Federation of America.*

Inspection *for* Maintenance

F. E. DIVINE, Maintenance Superintendent
Hammermill Paper Company

INSPECTION for maintenance is the attempt to maintain the equipment of a plant in operating condition, rather than to make the repairs after the machine or equipment has broken down and caused loss of production.

Inspection and maintenance for this purpose requires a great deal of scheduling of necessary inspections, adjustments and replacements. Each piece of equipment must be gone over at stated intervals, its condition noted and requests for needed adjustments written out and sent to the person or persons in charge of that crew of the maintenance department having the special craft or skill to perform the work in the most efficient manner.

The handling or keeping of costs or charges to the individual pieces of equipment must be coupled with the inspection. Each piece of equipment should be given an account number showing the location or special department to which it belongs. The cost department must later furnish the costs of lubrication, inspection and maintenance. The plant is divided into a number of main divisions. Each division is given a number, each division is subdivided again, showing the location of the piece of equipment, and the piece of equipment has a number: for example, 16-02-01 is a 10-inch pump located in the screening department handling stock to the dewatering plant. Another pump on the same service has the number 16-02-02. Having the equipment tabulated, an accurate record is kept of the condition and the cost of keeping it operating.

Inspection Division

The inspection division is made up of:

(a) Chief inspector.

(b) 3 Mechanical inspectors, who work on 8 hr. shifts.

(c) Electrical inspector.

(d) Lubrication inspector, who is in charge of all oilers in the plant.

(e) Belt man or inspector, who with his helper, makes all belt inspections and does all the belt work.

(f) Safety inspector.

The inspection is divided into two classes: electrical and mechanical.

Electrical Inspection

A pulp and paper mill operates as a continuous process, running from Monday morning to the following Sunday morning with no time for repairs on main equipment until it is shut down at the end of the operating period. Even then some of the prime movers operate during the shutdown. For these reasons, a schedule must be laid out with care.

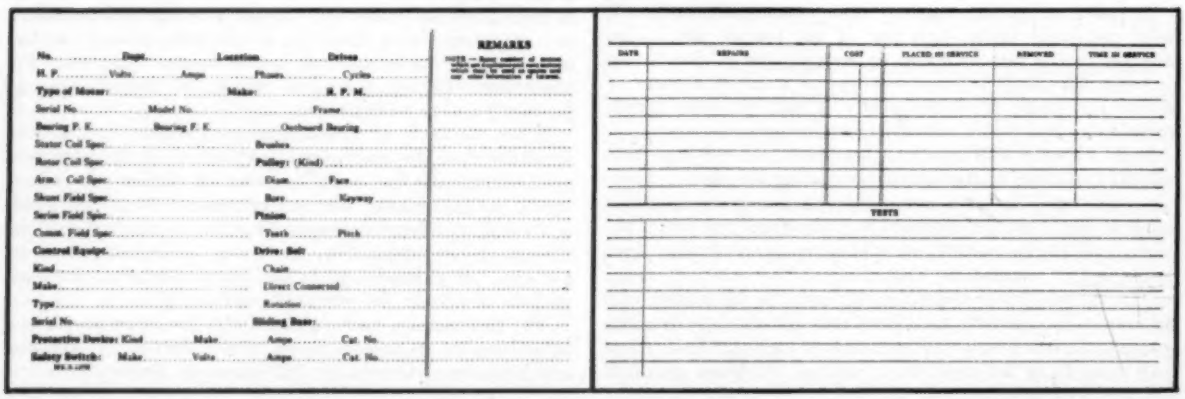
First, all motors are tabulated in a card index. Each motor is given a mill number and all information about the motor is on the card such as: mill number, department where located and what it drives—h.p., volts, amperes, phases, cycles, type of motor, make, r.p.m., serial number, model number, frame, bearing, all coil information and type of drive.

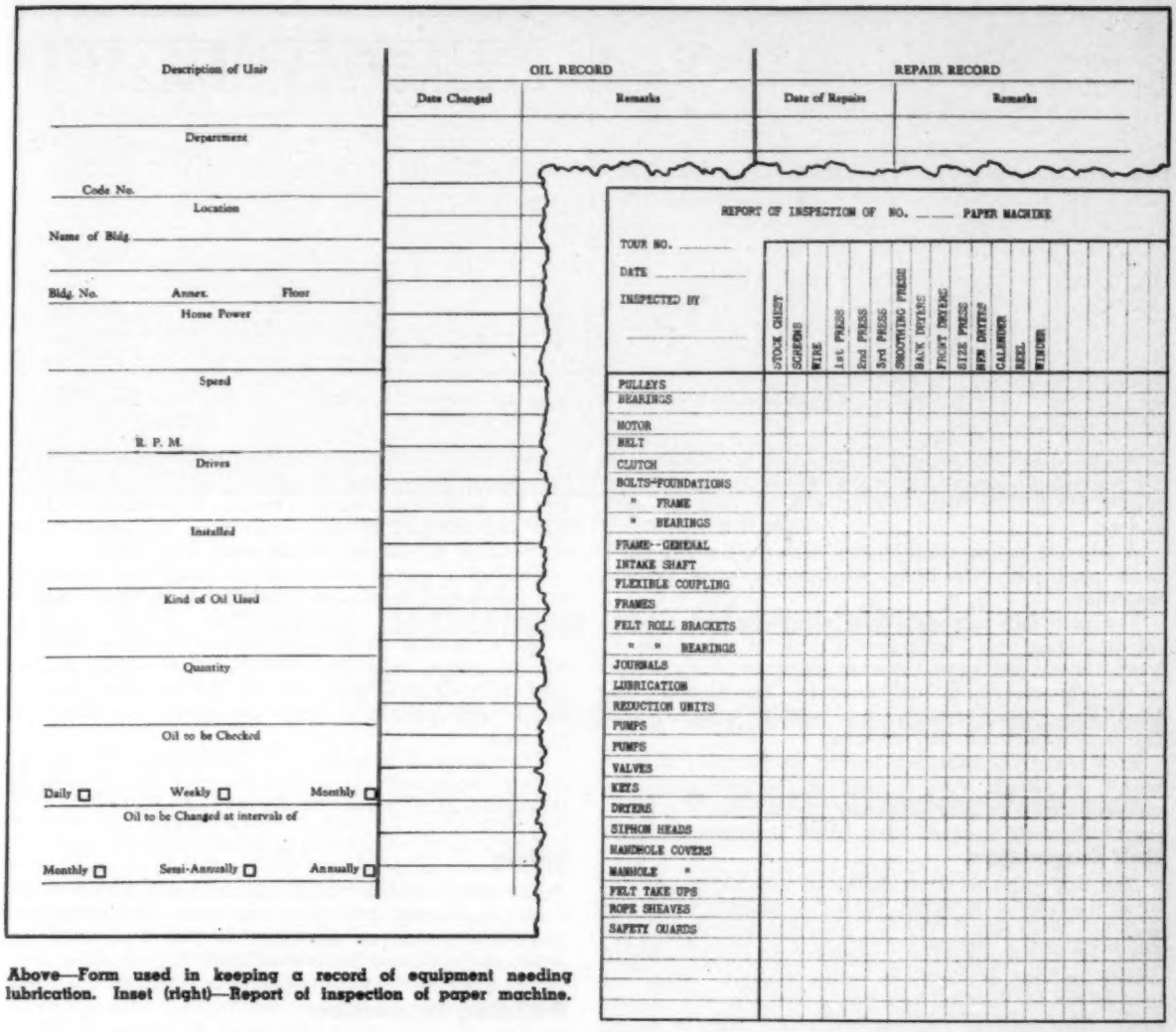
Besides the motor record, the file is cross indexed so that it is easy to find a motor of certain r.p.m., voltage or horsepower. A record of the movements of motors is kept; that is, when a motor is moved from one location, repaired or cleaned and sent to stores or placed on another drive. A record is made of all motors in one department. There also are a few other records, a complete list of which is: Motor record, r.p.m., voltage, horsepower, department list, motor movements, motor inspection sheet, and electrical inspection report.

With the above records as a base a schedule of inspection covering a year is set up. Some of the equipment is inspected once a month, other pieces once a year.

Electricians are on duty at the plant 24 hours per day and 365 days in the year. During the 7 to 3 shift on operating days, four electricians are on routine duty, one in each major department—paper mill, pulp mill, power department and general plant. During the other two shifts, one electrician cares for the entire plant. During the day, each electrician checks each motor and starting equipment in his separate department for oil and general condition, replaces necessary light bulbs and makes required repairs to any equipment that can be shut down during plant operation. The night shifts do general miscellaneous adjustments and repairs required during the shift. In case of major troubles, the chief electrician is called in. Each shift electrician makes a detailed inspection report calling attention

Card used in indexing motor records.





Above—Form used in keeping a record of equipment needing lubrication. Inset (right)—Report of inspection of paper machine.

to work done and any major adjustment or repairs required during the day or shutdown period.

The modern motor is being furnished with ball bearings and is lubricated with grease. As a rule, the bearings are grease-tight so new grease cannot be added without removing the old. A schedule is arranged so that the shift electricians completely overhaul the ball-bearing motors at stated intervals.

As motors are removed from any equipment, they are completely overhauled and then sent to the storeroom. A card is attached to the motor bearing the mill number. When the motor is used, the card is turned over to the electric inspector, who enters the change in the records.

Cables, both overhead and underground, transformers, fire and burglar alarms have a place on a schedule of inspection and tests.

Mechanical Inspection

Mechanical inspection is divided into three definite divisions:

1) Inspection for mechanical faults; as wear, misalignment, loose connections; as bolts on a line shaft, and pipe leaks.

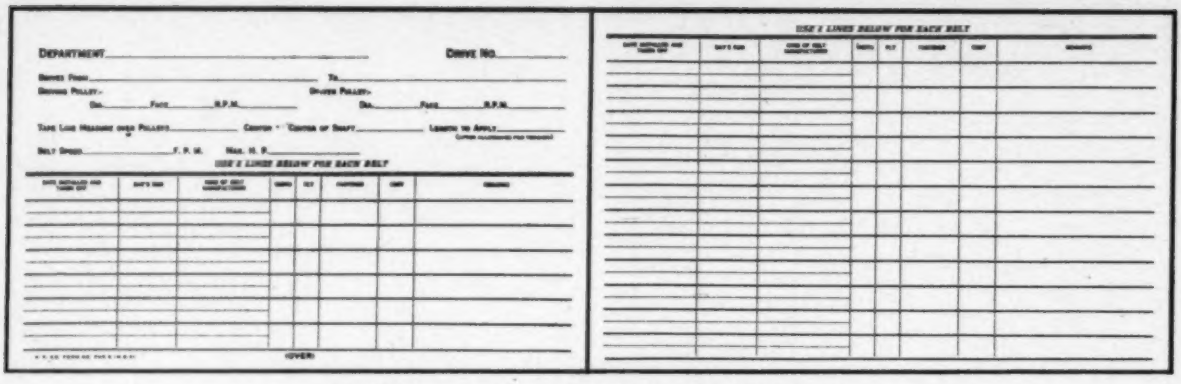
2) Inspection of lubrication; as checking the different oiling systems for amounts of oil, and their application.

3) Belt inspection—which handles inspection of belts during a shutdown period for loose belts, hooks and splices.

The shutdown of a paper machine for the failure of a mechanical part of the machine causes a loss of production which cannot be regained by the speeding up of the machine or by adding another machine, as is done in other industries. It is necessary to keep the machines in good condition at all times. A paper machine has a great number of bearings and rolls which must operate through the week, 24 hours per day.

The pulp mill has numerous pipe lines carrying water, acid, pulp, bleach and steam connected to pumps, as well as digesters, acid tanks, screens, bleachers and conveyors. All this equipment must be in operating condition as the making of pulp is a continuous process. Systematic inspection makes this possible.

Inspection of mechanical equipment is done by the three mechanical inspectors, who work on 8-hour shifts. The inspector on the day shift has one paper machine to go over each week. The report sheet called "Report of Inspection of Paper Machine" covers all parts of the machine. Under wire or fourdrinier are all of its parts, the drive, the bolts of foundation, the bolts of the frame, the journals, etc. The schedule is arranged so that each of the paper machines is inspected every six weeks. The reports are turned over to the chief inspector, who in turn makes out the requisition on the maintenance department for the



All details of each belt and its history are listed on this card.

necessary repairs to be made. The work is scheduled in the maintenance department and followed by the chief inspector and a close check is kept as to the time the work is done.

A schedule of inspection covers all the other equipment in the paper mill. This brings all equipment under periodic inspection.

The pulp mill is divided into six groups, according to the accounting code. Inspection is made of one group per week. Beside the regular weekly inspection, certain parts of the pulp mill require daily attention. The digesters, acid plant, blow pits, and the pumps handling acids, chlorine and pulp require the daily attention.

Each report on inspection has its special form so as to reduce the clerical work required of the field men. The use of forms is of great assistance in inspection.

Belt Inspection

The belt inspector is in charge of installation and care of all the belts in the plant. He has an assistant who works with him at all times. The belt inspector receives assistance from the maintenance force whenever necessary. Accurate details are kept of belts 4-in. wide or above. There is a card in the file for each belt that gives all details—department, drive number, what the belt drives, sizes of pulleys and r.p.m., tape line measurement over the pulleys and belt speed. In the lower section of the card is space for the belt history—date installed, day's run, kind of belt, manufacturer, width, ply, fastener, cost, repairs and other comments.

At some place on the belt guard, or on a near-by wall is attached a frabricated envelope in which is placed a waterproof envelope containing a card on which is the drive number and required length of belt. This information is of use in replacing the belt at the time of a breakdown.

The belt man makes an inspection of all the belts in the plant once a week and prepares any material necessary for the week-end shutdown.

Lubrication

Lubrication requires very close inspection to keep free of breakdowns. Here again inspection is a preventive tool. Lubrication inspection has helped to cut the cost of lubrication.

An inspector who is also in charge of all the oilers in plant has charge of the lubrication. In this way, the inspector has an assistant in each department.

The plant is divided in seven groups and each piece of equipment requiring lubrication is listed on a form giving the name, location, code number, date of installation, horsepower, speed, kind of oil, quantity, time of checking, time for changing. On this form is space for recording of dates and type of work done to the equipment.

Each week a group inspects all reduction gears, couplings, line shafts, pumps and equipment with anti-friction bearings for lubrication troubles, cleaning, replacement of bearings and changing of oil. Requisitions are issued to the maintenance department for the work to be done.

Packings of pumps come under this inspector, as packing that leaks affects lubrication. A record of the kind and size of packing is kept.

The lubrication inspector requisitions from the stores all oils and grease, and keeps a detailed record of the amounts used and the cost of such. At end of each month, the cost of lubricants per ton of paper produced is calculated and recorded.

The lubrication inspector is in close contact with the purchasing department and is kept informed of any new developments of lubricants by the oil companies.

Safety

The safety inspector takes care of safety guards of all kinds, by making a weekly inspection. He also makes periodic inspections of platforms, ladders, both wood and metal, and cables on cranes and hoists.

Building Inspection

The inspection of buildings is done by the superintendent who makes periodic inspections of each building as to the needed repairs to foundation and superstructure. Under this head comes the painting and roof inspection.

Scheduling of inspection with the detailed reports of necessary repairs has reduced the amount of lost time of production due to breakdown to an almost negligible amount.

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SOUTH'S FOREST MANAGEMENT

While it is generally recognized that the recent rapid expansion of the pulp and paper industry in the South can be of great advantage to the people of this extensive region, it must be borne in mind that only through good forest management and the adoption of integrated utilization on a sustained-yield basis can these inherent values be made permanent. . . . The growth of industry and the need for permanent employment of both people and land demand that progressively more wood be grown. The South's wood production, therefore, must be correspondingly increased to approach the full capacity of its forest lands to produce. . . . The future research program of the Southern Forest Experiment Station will be so formulated as to assist in arriving at these objectives. (Excerpt from article in *Forestry News Digest* by E. L. Demmon, director of Southern Forest Experiment Station.)

General view of laboratory building on college campus.

N. Y. State College of Forestry's Pulp and Paper Laboratory

W. O. HISEY, Associate Professor
Department of Pulp and Paper Manufacture

OPERATION of the paper machine early in November signalled the completion of the equipping of the new pulp and paper laboratory building at the New York State College of Forestry, Syracuse, New York. This laboratory building, containing an unusual array of semi-commercial pulp and paper equipment, as well as laboratories for student instruction and research, represents an investment of approximately $300,000 by the State of New York in educational and research facilities for the benefit of the pulp and paper industry. The leading position of New York State in the production of paper and paper products, and the importance of this industry to the State, were motivating factors in the development of the Department of Pulp and Paper Manufacture of the College of Forestry and the provision of the facilities represented by the new laboratory.

The laboratory is housed in a separate building on the campus of the College at Syracuse University, this building being approximately 140 feet long by 62 feet wide, and consisting of one story and basement. The building is substantially constructed of brick and reinforced concrete, and is of fireproof construction throughout. Altogether, some 18,000 square feet of floor space are provided in the building and are devoted exclusively to instruction and research in pulp and paper manufacture.

Laboratory Facilities

The main chemistry laboratory of the building contains desk space for forty students, only senior students in the department having desks in this laboratory. Here the chemical work in connection with the class work in pulp and paper manufacture is carried on, as well as the work in the chemistry of cellulose. Laboratory furniture here, as well as in other parts of the building, is of modern and durable type, being constructed of lead-coated steel with stone working surfaces.

The paper testing laboratory is equipped with air conditioning apparatus, designed and constructed by the Niagara Blower Company, of Buffalo, New York. This air conditioning system will not only maintain the laboratory at standard conditions for pulp and paper testing, but has sufficient reserve capacity to maintain the entire room at any temperature from 40 to 100 degrees Fahr. and at any humidity from 20 per cent to 90 per cent at any temperature. This reserve of capacity results in smooth operation and control of conditions within very close tolerances under standard conditions for routine testing and in addition provides the extreme flexibility required for special testing and research work. Figure 1 is a view of the interior of the paper testing laboratory and shows some of the numerous instruments available for testing paper and paper products.

The color laboratory, Figure 2, is equipped for the use of 20 students in paper coloring. A special feature of this laboratory is the lighting, since two of the most modern types of color matching light sources are available for matching shades. These are: (1) the Macbeth Color Identification Lamp, manufactured by the Macbeth Daylighting Company, of New York City; and (2) the Barkon Carbon Dioxide Lamp made by the Barkon-Frink Tube Lighting Company, of Long Island City, New York. The first of these lamps uses a high wattage incandescent light with a special filter, while the second uses a carbon dioxide filled glow tube to obtain a standard source of light, closely approximating north daylight in its characteristics. A new model Atlas Fade-Ometer is also available for the testing of dyes and papermaking materials for fastness to light.

The pulping laboratory, Figure 3, is equipped with a battery of small digesters and the necessary auxiliary equipment for screening and handling the pulp. Three digesters, two being of stainless steel, are available for experimental pulping. All of these digesters are equipped with outside circulation and heat exchangers and are arranged to give close control of temperatures and pressures during the cooking cycle. A hot oil circulation system is used to pro-

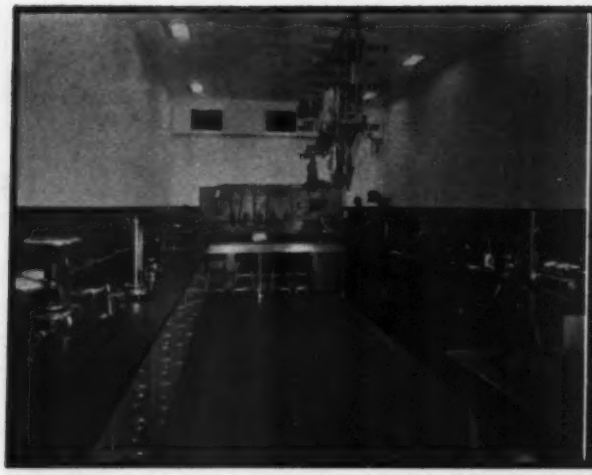


Fig. 1—Paper testing laboratory. Fig. 2—(Right) Color laboratory showing the battery of stirrers and special color matching lamps. Fade-Ometer in background.

vide the heat for these digesters and has proved to be very satisfactory from the standpoint of flexibility and control. Digesters and the hot oil system were especially designed and constructed for the laboratory.

The pulp testing laboratory is well equipped for the physical evaluation of pulps, and contains a battery of TAPPI standard pulp testing beaters, Canadian Standard freeness testers, and sheet machines. The sheet machines were designed and constructed at the College of Forestry.

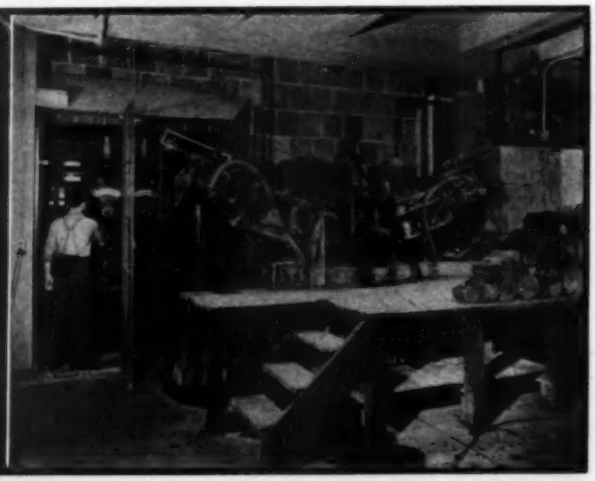
In addition to the laboratories described, there are two laboratories for research and special work, a machine shop, an office and a stockroom, with private laboratory adjacent.

Semi-commercial Pulping Section

The semi-commercial pulp mill, which occupies both the basement and the main floor in the southwest part of the building, is an integrated unit with facilities for the manufacture of pulps by all of the commercial processes, and for screening, bleaching, and handling these pulps in semi-commercial sized batches. The principal items of equipment included in the Pulping Division of the semi-commercial mill are: (1) a wood pulp grinder; (2) a chemical pulp digester of 65 cubic feet capacity, constructed of stainless steel alloy and suitable for either acid or alkaline processes; (3) a twelve-plate Impco flat screen; (4) a 54-inch decker; (5) four concrete stock chests of approximately 1000 pounds capacity each; (6) an Oliver filter, suitable for pulp washing and thickening; and (7) an extremely flexible pumping and piping system interconnecting these units. An interesting application of Goulds stock pumps is made in connection with this stock system, the pumps being portable, with pump, motor and starting equipment, all mounted on platforms with wheels. These pumps may be used interchangeably in a number of different set-ups for different purposes. Four such pump units are available. Stock and water lines throughout the building are of copper.

The wood pulp grinder, Figure 4, is of the Great Northern type with two pockets, and was constructed by the Carthage Machine Company, of Carthage, New York. This grinder takes a stone 32 inches in diameter, with an eleven-inch face, and has a nominal capacity of approximately one ton of pulp a day. The grinder is powered by a 250 hp. d-c. motor, with speed adjustment from 300 to 900 r.p.m. possible, corresponding to a stone peripheral speed adjustment of from 2500 f.p.m. to 7500 f.p.m. The direct current for the grinder motor is provided by a 200 kw. motor generator set, motor and motor generator being located in a separate vault behind the grinder. An unusually complete set of automatic control and recording instruments is provided for the grinder, giving full control over the pit temperature, shower water temperature, grinding pressure, grinding speed and a record of the grinding power.

Fig. 3—(Left) Pulping laboratory. Note stainless steel digesters and oil heating system. Fig. 4—Two-pocket pulp grinder, showing control panel for motor generator set and the d-c. motor driving the grinder.



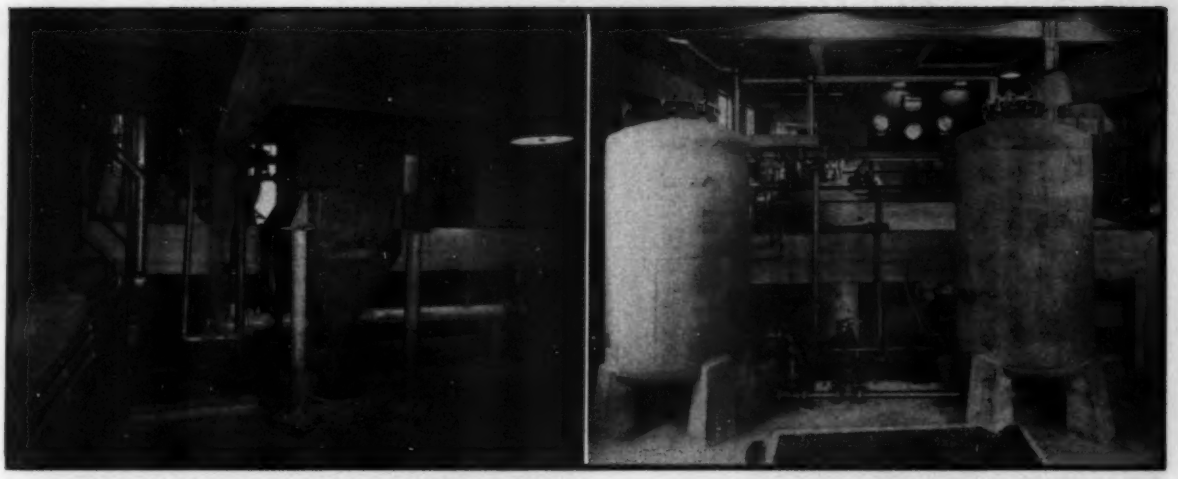


Fig. 5—Stainless steel digester, showing lower part of digester shell and the liquor circulation system and heat exchanger. Fig. 6—(Right) Stainless steel digester. Liquor system is in foreground and the control panel and instruments may be seen in background.

It is of interest to note that the pockets of this grinder, although they take wood only 8 inches long, are 14 inches wide in the direction of the stone travel, thus giving a grinding length in each pocket of 14 inches, comparable to that of commercial pocket grinders. This feature of design assists in giving a close correspondence of results with those of commercial grinders, which is of marked advantage in the transference of research results to plant operation.

The chemical pulp digester system consists of the digester itself, having a capacity of 65 cubic feet, and two liquor tanks, together with the necessary auxiliary equipment. Two views of the digester system are given in Figures 5 and 6. The digester and liquor tanks are constructed of an Allegheny Metal alloy containing 20 per cent chromium, 10 per cent nickel, a small amount of columbium to insure stability and corrosion resistance, and with a very low carbon content. With this corrosion-resistant construction, the digester may be used for any of the commercial pulping processes. The system was designed for an operating pressure of 250 pounds per square inch, giving an ample factor of safety for any probable operating pressure. The steel for the digester system was furnished by the Allegheny-Ludlum Steel Corporation, of Brackenridge, Pennsylvania; and the fabrication was by Struthers-Wells, Warren, Pa.

Figure 5 shows the lower part of the digester, together with the heat exchanger and liquor circulating system. The circulating system was designed by Fibre Making Processes, of Chicago, and in operation it takes the liquor from a strainer ring located near the middle of the digester shell, recirculates it through the heat exchanger, and into both the top and the bottom of the digester. This system insures good circulation and uniform distribution of heat and liquor, even though the amount of liquor in the digester is relatively small as is the case in alkaline pulping. Provision has been made for direct injection of steam in the bottom of the digester, if required.

A very complete automatic control system has been provided for the digester, utilizing instruments of the Brown Instrument Company, of Philadelphia, Pennsylvania. The control panel and its instruments are visible in Figure 6. A time-cycle temperature controller is utilized to control the steam admitted to the heat exchanger, and a time-cycle pressure controller is connected to an automatic relief valve. Temperature and pressure curves may be cut on cams, and permanently preserved, so that cooks may be duplicated at any time. A steam flow meter is provided to record the amount and rate of steam consumption of the digester. In addition, a multiple recording Brown potentiometer has been installed to give a record of the temperature at six different points in the digestion system. With this instrument it will be possible to study the distribution of heat in the digester under various cooking conditions.

Fig. 7—(Left) Steam compressor. Fig. 8—Oliver vacuum filter unit, showing filter, drive, separator, and high density bleaching unit.

One very interesting feature of the digestion unit is the installation of a steam compressor to provide high pressure steam for the digester. This steam compressor, shown in Figure 7, was designed and built by the Pennsylvania Pump and Compressor Company, of Easton, Pennsylvania. The steam supply for the laboratory is obtained from the plant of Syracuse University, and is insufficient in pressure and temperature for the operation of the digester. The steam compressor takes line pressure steam on the suction side and delivers it at the higher temperature and pressure required for the digester. The maximum capacity of this unit is 1300 pounds of steam an hour, compressed from 100 pounds pressure to 250 pounds pressure, a 50 hp.-motor being necessary under these conditions. The actual temperature and pressure of the steam delivered will depend on the requirements of the cooking schedule, actual delivered pressure being controlled by means of an automatic by-pass valve which is actuated by the Brown time-cycle temperature controller on the digester. Extreme flexibility is obtained by this set-up, so that almost any required temperature schedule may be obtained in the digester.

Pulp from the digester is blown into a tile-lined concrete blowpit, the lining being furnished by the Stebbins Engineering and Manufacturing Company of Watertown, New York. This blowpit has a perforated stainless steel bottom for the separation of waste liquors from the pulp. After washing, the pulp passes to the screening, deckering and bleaching systems to which reference has already been made.

The Oliver filter and the high density bleacher are shown in Figure 8. This filter, like all other semi-commercial equipment in the laboratory, has been designed to give extreme flexibility in operation. It is equipped with a rubber-lined vat and filter drum, and has a stainless steel facing wire, so that it may be used for handling pulp under extremely corrosive conditions. Other special features of the filter include a set of de-mountable press rolls, which may be used to obtain high density of discharge; a set of de-mountable shower pipes for use in washing pulp, and a variable speed drive through which a wide range of operating speeds may be obtained.

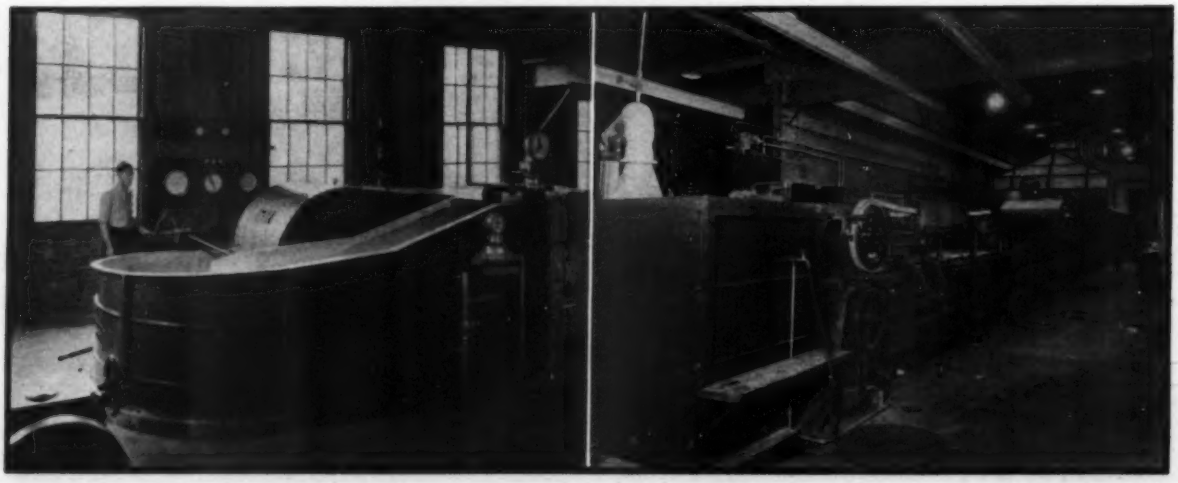
Papermaking Unit

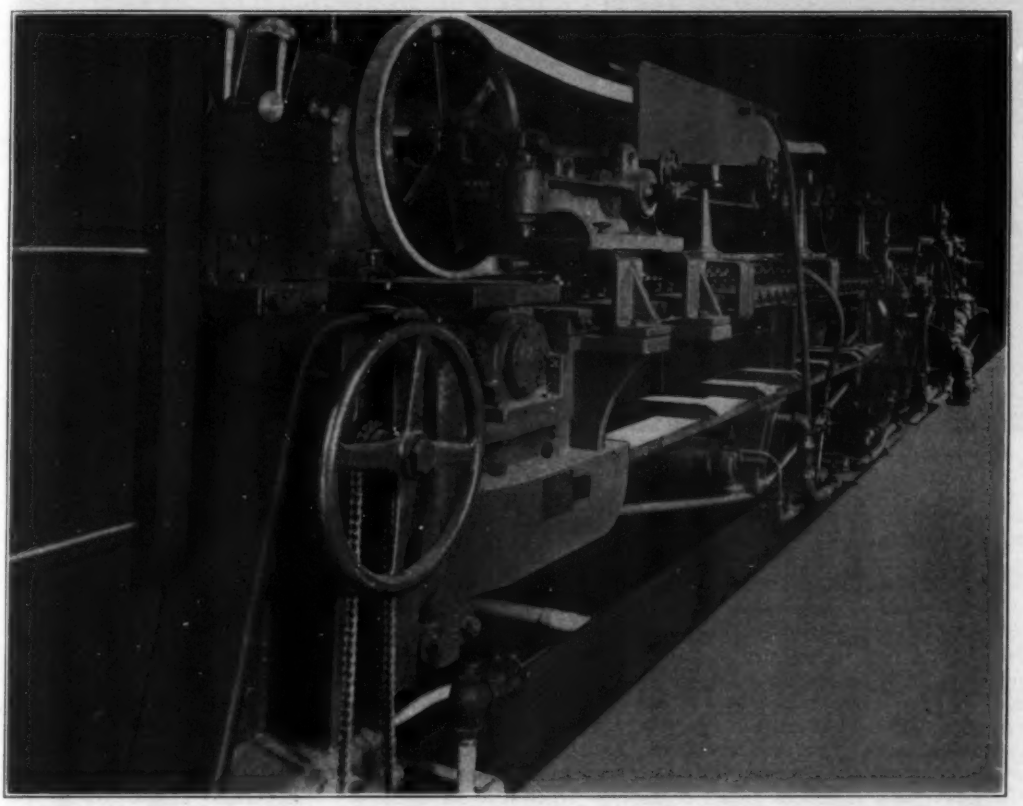
The major feature of interest in the laboratory is the papermaking unit, which occupies the entire east side of the building. This unit consists of a special combination cylinder and fourdrinier paper machine, together with a semi-commercial sized beater, a refiner, stock chests and all the necessary auxiliary equipment for the manufacture of paper. In designing the paper machine and its auxiliary equipment, every effort was made to provide a unit of maximum flexibility, which could be used for a wide variety of purposes, and yet which would be, as near as possible, a narrow section of a commercial machine so that results obtained from experimental work would be comparable with commercial practice and operation.

The pulp beater, which was provided by Dilts Machine Works, Inc., of Fulton, New York, has a capacity of 600 pounds of dry fiber, and has been arranged to provide the utmost in flexibility of operation and control. Every effort has been made to obtain a research instrument in this beater, as well as a beater for the production of suitable stuff for the machine, so that the beater is arranged for a study of the variables of important stuff preparation problems. The roll, 45 inches in diameter and 36 inches wide, weighs 7500 pounds, and controls have been provided to enable the determination of the reaction between the roll and the bedplate under any combination of operating conditions. In order to accomplish this result, the lighterage system of the beater is supported on Taylor Instrument Companies pressure recording elements, which produce a record of the unbalanced weight of the roll and thus enable the determination of the reaction between roll and bedplate. In addition, air operated thrust cylinders have been attached to the lighterage mechanism in such a manner that the effective weight of the roll may be increased or decreased at will. A position recorder is also included in the instrumentation of the beater, so that the position of the roll in relation to the bedplate may be determined at any time. Other features making for flexibility in operation and facilitating study of beating theory and practice include the provision of three bedplates, which may be used in different combinations, and means by which the arrangement of bars in the roll may be altered, if necessary. A view of the beater and control instruments is included in Figure 9.

A Weiner refiner has been provided for use in connection with the paper machine, in place of a standard type jordan engine. The primary reason for this choice was to obtain flexibility, since the tackle in the refiner may be changed very simply and readily, thus making a wide range of plug and shell fillings available for investigative purposes. The refiner is powered with a 40-hp. variable speed d-c. motor, with a speed range of from 800 to 2400 r.p.m., thus providing a tip speed of the plug bars which includes the range of commercial operation of jordan engines. The piping system has been arranged to allow for changing the direction of flow through the refiner and to enable operation of the unit

Fig. 9—Semi-commercial beater, capacity 600 lb. Control instruments for operation of the beater in the background. Fig 10—(Right) Fourdrinier section of paper machine.





Sandy Hill "Ideal" Fourdrinier Installed in laboratory of New York State College of Forestry, Syracuse University.

The Sandy Hill "Ideal" type fourdrinier has been supplied to, and satisfied, a number of paper mills. It provides a suspension type of frame in one piece—eliminating breakable parts. The Sandy Hill fourdrinier insures smooth harmonic motion from the shake.

Combinations of Bertrams and Sandy Hill equipment to give multiple shake and center adjustable pitch fourdriniers are available.

The Sandy Hill Iron & Brass Works

Hudson Falls, N. Y.

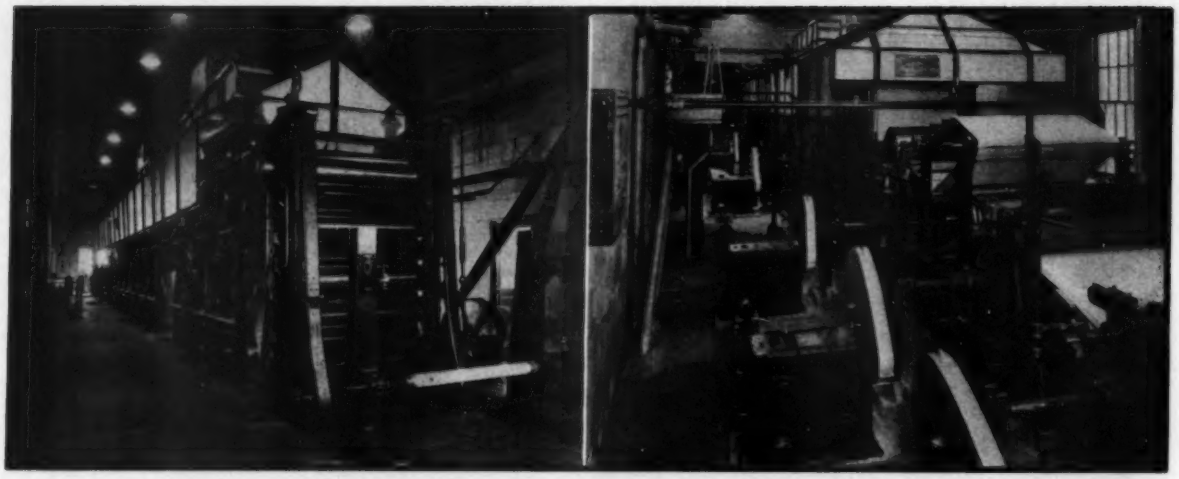


Fig. 11—(Left) Dry end of paper machine. Fig. 12—Back side of paper machine, showing line of drive units.

under pressure whenever such operation might be desired.

The paper machine, constructed by the Sandy Hill Iron and Brass Works, of Hudson Falls, New York, was also designed for the utmost in flexibility and contains several unusual features to suit it to investigational and instructional work.

The fourdrinier part, shown in Figure 10, takes a wire 52 inches wide and 50 feet long, thus providing a forming section suitable for operation at speeds up to 500 f.p.m. on lightweight papers. Two inlets have been provided, one of the high head type for the higher speed ranges, and the other the standard double-slice arrangement for lower speeds. These two inlets are interchangeable, making the machine suitable for the formation of a variety of grades of paper. The table rolls, 39 in number, are 3½ inches in diameter and provide ample water removing capacity for slow stocks. Table rolls have been arranged in such a manner that they may be moved on the rails and roll spacing readily altered. Four suction boxes, with composition tops, and a suction couch roll are provided.

The press section consists of two presses, both with rubber-covered bottom rolls. The first press has a Stonite top roll, while the second press has a bronze top roll. Press rolls are 14 inches in diameter.

The dryer section consists of 17 dryers, four feet in diameter, and a lead dryer. These dryers are arranged in two nests, with twelve of the four-foot dryers and the lead dryer in the first nest and five dryers in the second. Between the two sections of dryers, space has been left for installation of a size press. A J. O. Ross Engineering Corporation hood covers the dryer section, and connects with two ventilating fans for the discharge of moisture laden air. Four air outlets are provided in the hood, with control dampers in the ducts, so that distribution of air may be controlled easily.

Figure 11 is a view of the dry end of the machine, showing the seven-roll calender stack and the machine reel.

The drive mechanism, Figure 12, used on this machine is of a new type, patented by the Syracuse Supply Company of Syracuse, New York, and built by the Morse Chain Company of Ithaca, New York. These drive units represent the application of new developments in the field of mechanical power transmission to the problem of paper machine drives. Draw control in these units is attained through the use of variable pitch V-belt sheaves which replace the cone pulleys of previous types of mechanical transmissions for paper machines. The use of high speeds on belts, chains, and hypoid gears in the units results in high capacity and high mechanical efficiency, test results showing better than 97 per cent mechanical efficiency. The master drive for the machine is a variable speed d-c. motor, which drives the line shaft passing through each of the six individual drive units. All units are thus mechanically interlocked, resulting in a high degree of uniformity in the operation of the machine. The drive mechanism has been arranged to enable a very high degree of variation in machine speed, ranging from a low of 35 f.p.m. to a high of 500 f.p.m.

The cylinder section of the paper machine is located in the basement under the first dryer section. This cylinder part consists of five cylinders, each 30 inches in diameter with a 54-inch face, together with a Farnham suction roll, squeeze rolls, baby presses and the necessary screens, pumps and other auxiliary equipment for operation of the cylinder wet end. In operation, the paper from this cylinder section will be carried from the basement to the first floor on a felt which will replace the first press bottom felt, and will pass through the main press section and dryer section in the normal manner. With this cylinder section, it will be possible to form moderately heavy boards, so that the range of papers which it will be possible to manufacture with this machine will be very wide.

Students in the Department of Pulp and Paper Manufacture will have the opportunity of obtaining very practical and valuable experience in connection with the operation of this machine in the last semester of their senior year. Operation of the machine during this period will be definitely planned to provide these students with a basic understanding of the processes and problems involved in the manufacture of paper. Such experience should prove extremely valuable to the employers of these students after graduation.

Facilities of the laboratory are available to organizations in the paper and allied industries for research and developmental work, at fees which are calculated to cover the cost of operation. It is to be expected that many development problems which are impractical to work out on a plant scale, due to interference with normal operation and uncertainty of results as a result of the many operating problems involved, may be brought to this laboratory and worked out with a minimum of expense and a maximum of certainty that the results achieved may be transferred to plant operation.

Prof. C. E. Libby is in charge of the Department of Pulp and Paper Manufacture. The purchase and installation of the machinery and equipment in the laboratory building has been under the supervision of W. O. Hisey, Associate Professor. Dr. E. C. Jahn is in charge of the work in cellulose chemistry which is sponsored by the Department of Pulp and Paper Manufacture. F. W. O'Neil is Instructor in Pulp and Paper Manufacture.

THE SLOWNESS (FREENESS) OF YOUR STOCK

Upon which depend so many important factors of production is measured in standard units by means of the **Standard Laboratory Slowness Tester.**

In that instrument you have combined the exact Canadian Standard with the most modern design, the highest accuracy, and the fastest operation. The Canadian Standard is accepted throughout the American Continent as the standard of reference, and departs but little from the original Green.

The **Standard Laboratory Slowness Tester** is found in mills and laboratories throughout the United States and Canada, and has been giving outstanding service for more than twenty years. Today it reaches its highest development, for it has always been progressively improved:—

First: The Standard sets up anywhere ready for work in three minutes.

Second: Readings check within 2%.

Third: Two to five determinations every minute.

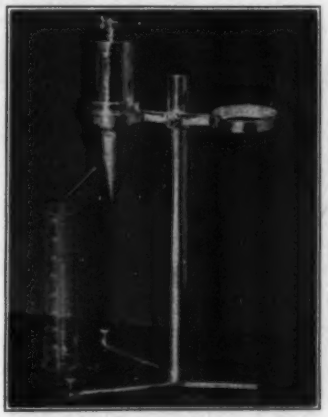
Fourth: Every test starts with stock in full contact with screen. No entrained air. No impact.

Fifth: Determinations automatic. No human error.

Sixth: Screen held mathematically flat and level. No possibility of sag.

Seventh: No more maintenance than the family water pitcher.

Eighth: Neat, businesslike, good to look at. Finished in bright chromium.



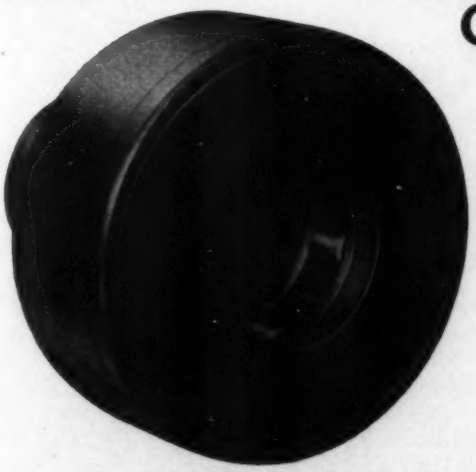
The **Standard Laboratory Slowness Tester** applies without change to the widest range of different stocks and different stock preparation procedures. It brings them all to one recognized basis of comparison.

The **Standard Laboratory Slowness Tester** comes securely packed, complete with full directions, glass graduated cylinder, and graphic conversion charts covering groundwork, kraft, soda, and sulphite.

ARTHUR B. GREEN
284 Harris Avenue, Needham, Massachusetts

ANNOUNCING

The *NEW* NASH AUTOMATIC SAFETY COLLAR



PATENTS APPLIED FOR

- *NO ACCIDENTS*
- *NO SLIPPING*
- *NO SET SCREWS*
- *NO WRENCHES*

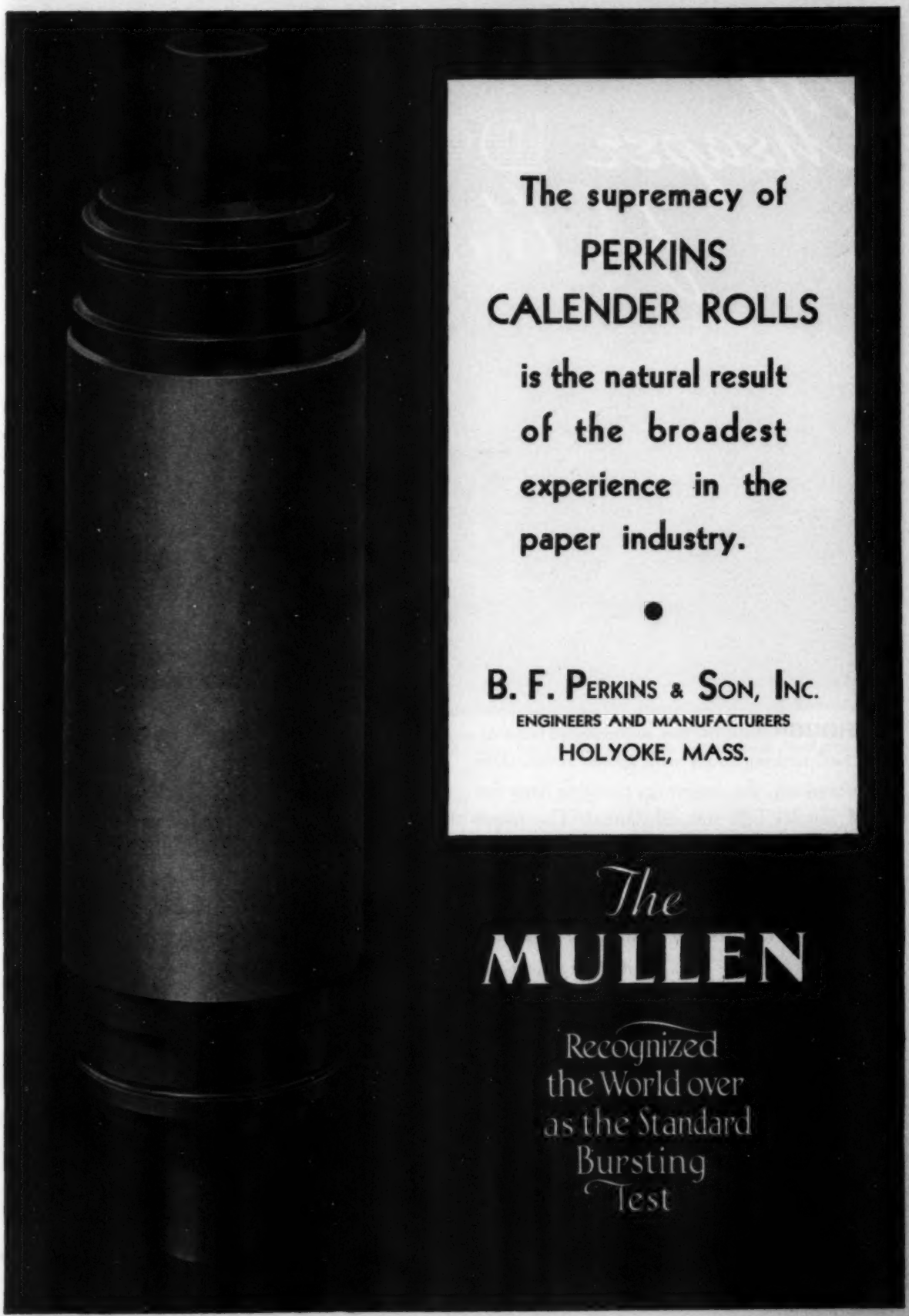
Time Saver - Locks Automatically in Three Dimensions.

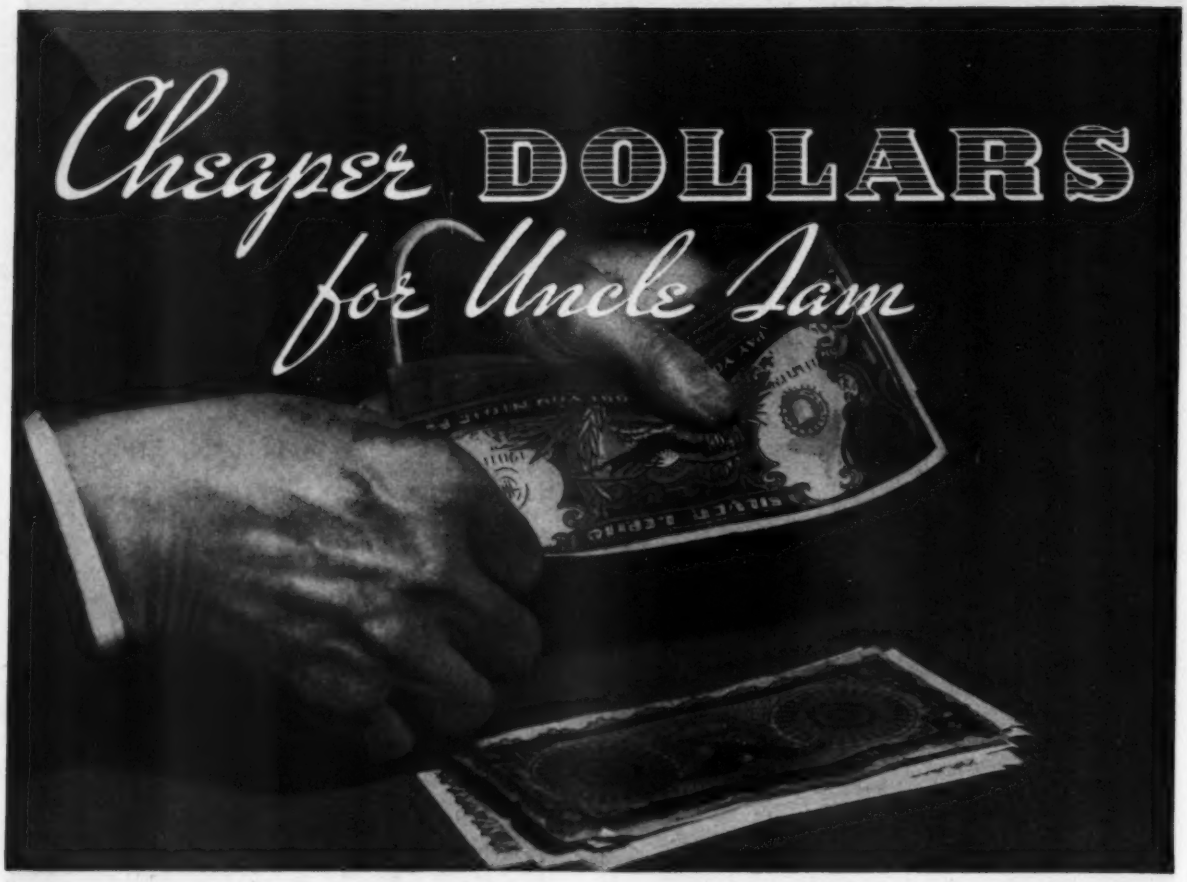
GILBERT & NASH CO., Menasha, Wis.

WRITE US FOR PARTICULARS

PAPER SKETCHES

IMPRINTED STRIPS OF COTTON PAPER "ABOUT A PALM IN LENGTH AND BREADTH" WERE USED AS MONEY IN CATHAY FOUR CENTURIES OR MORE BEFORE PAPER MONEY WAS USED IN EUROPE.
IN THE EARLY 1860'S (BEFORE READY-MADE CIGARETTES BECAME COMMON) LONDON TOBACCO SHOPS SOLD TUBES OF BROWN PAPER INTO WHICH CUSTOMERS, WITH THE HELP OF MOULDS AND "PUSHER STICKS," RAMMED CUT TOBACCO.
A LAW PASSED IN FRANCE DURING THE MIDDLE AGES FORBADE PAPER-MAKERS OF THAT COUNTRY TO HASTEN RAG FERMENTATION BY TREATING THE RAGS WITH LIME!
John Dickinson
ABOUT HALF THE PAPER PRODUCED TODAY IN THE U.S. IS MADE ON CYLINDER MACHINES WHICH EMPLOY PRINCIPLES EMBODIED IN THE MACHINE INVENTED BY THE ENGLISHMAN, JOHN DICKINSON IN 1809.


The supremacy of
PERKINS
CALENDER ROLLS
is the natural result
of the broadest
experience in the
paper industry.
B. F. PERKINS & SON, INC.
ENGINEERS AND MANUFACTURERS
HOLYOKE, MASS.
The
MULLEN
Recognized
the World over
as the Standard
Bursting
Test



ALTHOUGH the reduction in the size of treasury notes had nothing to do with official revaluation of the currency, the economies resulting from the use of smaller bills are substantial. The paper used in printing United States currency represents just about the highest development in the history of paper technology. This, in turn, is reflected in its cost. » » But the mechanical processes of making this paper are common to the entire industry. Extraction of water from the web before it passes to the dryers is paramount. To effect this is the function of the felt at the wet end of the machine. Because Hamilton Felts remove the water faster, more completely and more uniformly they are used by the mills that supply the United States Government with bank note stock.

From the thinnest tissue to the heaviest board, there is a Hamilton Felt that will do your work better, faster and at lower cost.

•

SHULER & BENNINGHOFEN, HAMILTON, OHIO

• Miami Woolen Mills, Established 1858 •

Hamilton Felts are marked by two blue lines full width of the felt and by one shorter blue line midway between them.

Hamilton Felts

From Pushcart to BOARD MILL

THIS story might be called a success story, and, if written in the style of that author, it might fit into the group of tales penned by Horatio Alger. But, figuratively speaking, that is putting the cart before the horse.

The newly-completed addition to the plant of the Clifton Paper Board Company, Clifton, New Jersey, marks the climax in the life story of a 64-year old man named Frank Desiderio, Italian immigrant, who left home near Naples in 1904 to seek a living, if not a fortune, in America. With pushcart and baling hook, he plied his adopted trade of collecting scrap paper. He started at the bottom of the paper business, with not even a slightly-spavined horse and creaking wagon for capital investment, and with never a thought of the future outcome of his humble beginning.

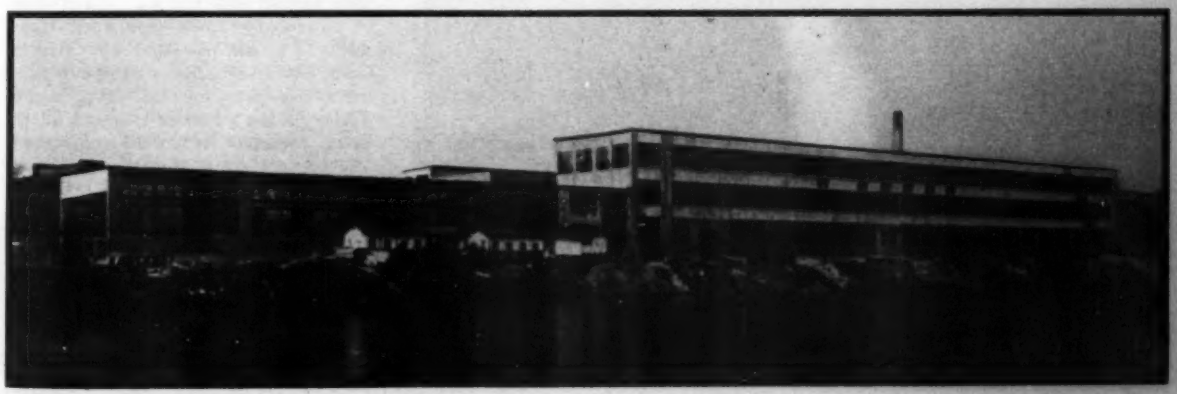
Two years later, in 1906, he moved up a step by purchasing a horse and truck. Then—more horses, more trucks, more scrap paper, more business. In 1918, Frank and his son, Anthony, traded in the trucking equipment of the old days and moved into the new era with a two-cylinder Autocar. That was a habit formed by the Desiderios—this moving forward into new eras. The scrap paper business prospered, new and larger trucks were purchased, and today the scrap branch operates 40 trucks and trailers, traveling 1,200,000 miles a year in the metropolitan district of New York and to the Desiderio mills. What mills? That is why this story has been written, and to the reader who has not known this unusual story of the Desiderios, that 64-year old immigrant and his seven sons now own and operate the Desiderio mills at Whippany and Clifton, New Jersey, and Durham, Pennsylvania.

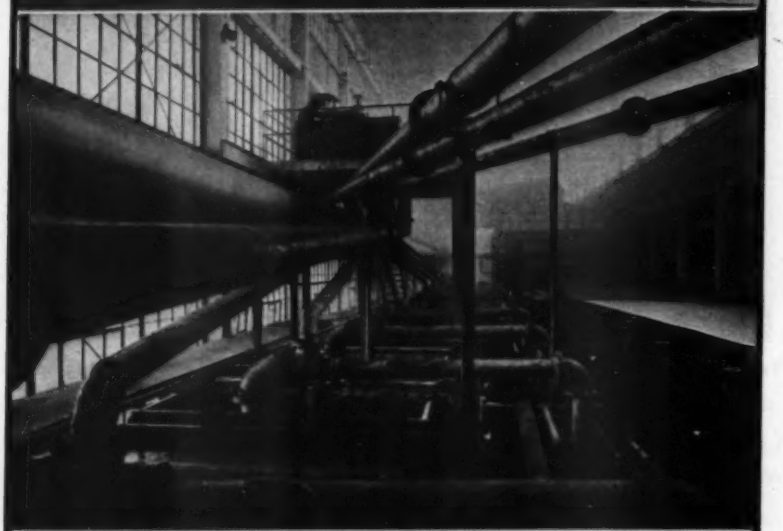
Four of the seven sons of Frank Desiderio. Left to right: Michael, Thomas, Anthony (president of Clifton Paper Board Company), and Dominick Desiderio.

▶▶▶ The story of how the Desiderios entered the board manufacturing business started during the country's greatest depression. In 1932, the board mill in Clifton had many creditors, and the Desiderios were the largest. The mill, like many others, went into bankruptcy and the leading creditor bought it in.

Frank and his son, Anthony, now

General view of the plant of the Clifton Paper Board Company, Clifton, New Jersey.





president of all the companies, and the rest of the family, pictured possibilities of integrated control of raw materials, mills and distribution. They were not just taking in a paper mill for a bad dept. Besides, it was a small plant with annual capacity of 12,000 tons and they immediately began advancing the output to 35,000 tons. In that same year, they purchased the Whippany Paper Board Mill from the United Paper Board Company, and in 1934 acquired still another small mill at Durham, Pennsylvania, from the Sanitary Products Company. "Outmoded and obsolete," said the previous owners. But the Desiderios operated them at a profit.

Then, in 1937, while almost everyone was talking about expansion of the paperboard industry, the Desiderios decided to expand the Clifton mill. Why? To answer that query, visualize, for a moment, Clifton, New Jersey, strategically located about thirty minutes from Broadway in the great metropolitan district with its 13,000,000 population, producing scrap newsprint and office waste in enormous volume; consuming paper and paperboard in similarly large tonnage.

Above—Enlarged power house which furnishes power for the Clifton plant. Center—Looking into the machine room from the three-story beater building. Below—Close-up of wet end.

▶▶▶ Now the Desiderios, from Frank, the father, to Michael, the youngest, do not do things by halves, quarters, or three-quarters. Complex alterations and extensive new construction were needed. So they retained the Austin Company, well-known engineers and builders of pulp and paper plants in many sections of the country. This expansion has added to the Clifton mill a new 428-foot paper machine room, a three-story beater building, a power house addition, and a two-story warehouse with 50,000 square feet of storage space. These changes brought the Desiderios what they wanted and needed, and it may be described by the single word "flexibility." That is what the Austin Company and builders of the equipment that was installed gave them. Today, in the words of Anthony Desiderio, president of all the companies, "We've got them all licked on costs and operation." To support his statement, the president of this company points with pride to the Clifton mill. Let's take a trip through the addition to this plant and see some of the new equipment that has been installed.

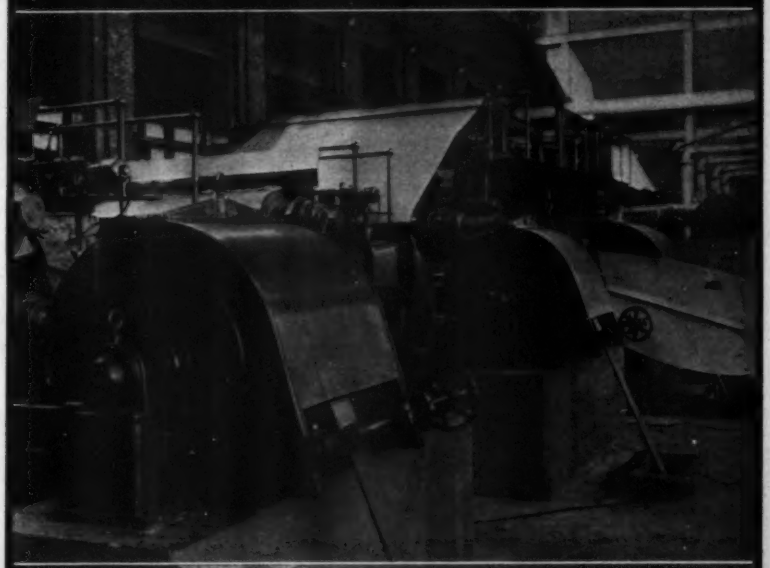
▶▶▶ The new 143-inch, 8-cylinder board machine, built by the Bagley and

Sewall Company, was designed specifically for the production of a wide range of board weights. Each of the moulds, individually carried on Timken bearings, has a diameter of 48 inches and a face of 143 inches. Two pumps service each vat, one for stock circulation, and the other for the handling of white water. There also is a Manhattan 22-inch diameter by 148-inch face couch roll for each cylinder.

The wet pick-up felt runs in a forward direction toward 4 primary presses, it being contacted by a lower felt as it leaves the last vat. The first and third primary presses are suction units, while the second and fourth presses are of regular press design.

The main press section of the machine includes a suction first press, and 2 regular presses. Vacuum requirements for both the primary press section and the main press section of the machine are met through the use of Nash pumps, while S. K. F. bearings carry all of the press rolls of both sections.

The dryer section includes 128 42-inch diameter by 138-inch face drying cylinders. The section makes use



Above—250-ton paper board machine in the Clifton Company's new plant. Center—Motive power for wet end. Below—Board cut to accurate sizes and ready for delivery to box manufacturers.

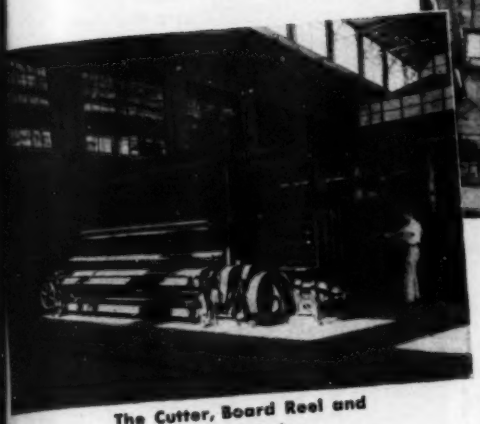
of a vertical framework, each vertical section being designed to carry 18 dryers. The lead-in dryers precede the vertically-arranged dryers to expedite the cutting of a tail for introduction to the automatic paper carrier which is installed in connection with the vertically-arranged dryers.

Among the other interesting features of the dryer section is a Midwest-Fulton system for supplying steam to the dryers, and for evacuating condensate from them; a Bowser continuous oiling system, and a Ross transite hood. Vickery doctors also are supplied for a number of the wet end dryers. The dryer section is followed by two stacks of calenders, also Vickery-doctor equipped. The first stack contains 6 rolls, the second, 8, and the lower roll in each stack is 26 inches in diameter, the intermediate rolls, 12 inches, and the top rolls, 16 inches. A Cameron slitter, a Black-Clawson duplex cutter, a Bagley and Sewall vertical two-drum reel, and a Cameron rewinder complete the equipment on the dry end of the machine.

Totally enclosed spiral bevel gear units, serving as the driving arrangement for the machine, connect with a line shaft which receives its power in-put from a Moore turbine.

The 143 inch Clifton
Board Machine by
Bagley & Sewall Co.

View of Third Press and Vertical Stack Dryers



The Cutter, Board Reel and Board Winder

Front View of Cylinder Vats, Auxiliary Presses and Main Presses

Modern Bagley and Sewall Eight Cylinder Board Machine in Production at Clifton Paper Board Company, Inc. - -

• The eight cylinder, 143 inch board machine installed in the new mill of Clifton Paper Board Company, Inc., is one of the largest machines of its type operating in this country.

The machine is equipped with eight cylinders, 48 inches, diameter and vats of the Controlled-Flow type, built by Bagley and Sewall Company. These vats are of a comparatively new design and a most interesting type, which make possible the production of both light weight liner sheets and heavier weight filler sheets. It is largely because of the type of vats installed that the machine is able to produce a wider range of grades and weights than is usually possible in board mill operation.

Following the cylinder molds are a series of primary presses combining the use of both suction and plain presses, these being used alternately. The first main press of the suction type is followed by two regular presses of the conventional design.

The dryer section of the machine is equipped with 128 dryers, 42 inches diameter, all arranged in vertical stacks.

Following the dryer section there are two stacks of calenders, cutter, board reel and board winder.

The machine parts are driven by the Bagley and Sewall enclosed spiral bevel gear floor cone drives of the compound type.

The machine is driven by a Moore steam turbine, with variable speed reducer and direct connected to the line shafting in the basement.

• • •

The Bagley & Sewall Company - Watertown, New York, U.S.A.

Driving at the Dryers, Calenders and Reel

BAGLEY B&S SEWALL

Enclosed Spiral Bevel Gear Drives

▶▶▶ Going around to the initial point of operation, two Dilts breaker beaters, one for top and bottom liner, and the other for filler, have been installed for the preliminary preparation of stock. The filler breaker, designed for a capacity of 150 tons of 4 to 5 per cent consistency stock for 24 hours, is totally submerged beneath the floor in the breaker beater building of the old mill. This beater discharges its stock through a perforated back-fall and extraction pit to a steel regulating box with an adjustable weir control. An 8-inch double-suction 1,400 g.p.m. Hayton Miami pump delivers the stock from this regulating box to a settling trough of ¼-inch Armco steel plate construction. The trough is 65 feet long and 9 feet wide, and was built by Dilts Machine Works, Inc.

Two Cowles Classifiners, located directly below the settling trough on top of the breaker beater stock chest, receive the stock from the settling trough by gravity, and in passing through them, foreign matter is separated from the good stock—the good stock being returned to the settling trough and the rejects being discharged to 2 Cowles detrashers. The detrashers, in turn, separate the remaining good stock from the foreign matter and return it to the settling trough.

Accepted stock from the settling trough is thickened on 2 Shartle thickeners, each of which make use of a rubber couch roll and a 36-inch diameter by 120-inch face mould. White water from these thickeners is pumped back to the settling trough by an 8-inch, double-suction Gould pump, while the thickened stock is deposited into a breaker beater stock chest. This chest is of reinforced concrete construction, has a capacity of 10,000 lb. of 4 per cent stock, is of the midfeather type, and is 54 feet long, 11 feet, 4 inches wide, and 9 feet deep.

Agitation of the stock is secured through the use of a Hayton Miami No. 20 agitator which, in turn, is directly connected to a 10-inch, double-suction Miami stock pump. The pump, which has a capacity of 3,000 g.p.m. of 4 per cent consistency stock, delivers the stock from the chest to beaters located on the main beater room floor, for final beating treatment.

Provisions also have been included for adding other new stock-preparing equipment in the near future. The liner breaker beater, located on the third floor of the beater room building, has a capacity of 60 tons of dry paper in 24 hours. It discharges by gravity through a steel regulating box to beaters located on the floor below, from which, after treatment, the stock is dumped by gravity to 3 Kalamazoo Tank and Silo glazed tile beater dump chests, which are located on the basement floor of the new beater building.

The filler stock chest is 24 feet long, 12 feet wide, and 11 feet, 8 inches high over-all; the top and bottom liner chests, 24 feet long, 12 feet wide, and 11 feet, 8 inches high over-all.

A Hayton Miami No. 14-6 combination agitator pump agitates the stock in the filler chests, and also pumps it to the Jordan regulating head box. The other two chests are equipped with paddle-type horizontal agitators. Plunger-type pumps are used to deliver the stock from these chests to the same jordan regulating head box. This box, designed and built by the Clifton Paper Board Company, is a three-way box built to handle filler, bottom liner, and top liner, and is designed to eliminate a header pipe and an intricate valve arrangement.

On the floor below this head box, directly above the machine chests, are 5 No. 2 Shartle Miami jordans. Each of these jordans, operating at a speed of 450 r.p.m., has a capacity of 30 to 40 tons of paper in 24 hours. Receiving their stock from the head box, the jordans are arranged in such a way that they may be run tandem, singly, or interchanged, on any of the three grades of stock, and they discharge into the filler, bottom liner, and top liner machine chests. These chests, also of Kalamazoo glazed tile construction, discharge to a regulating stuff box located in the machine room over 8 No. 3-A Bird screens, and 1 16-plate flat screen which together service the machine.

CONVENTIONS AND COMING EVENTS

Jan. 19—Book Paper Manufacturers Association, Waldorf-Astoria, New York City (Committee Meetings).

Jan. 19—Writing Paper Manufacturers Association (Sulphite Bond Group), Waldorf-Astoria, New York City.

Jan. 20—Book Paper Manufacturers Association (General Meeting), Waldorf-Astoria, New York City.

Jan. 25-27—Canadian Pulp and Paper Association, Technical Section, Annual Meeting, Mount Royal Hotel, Montreal.

Feb. 20-22—National Paper Trade Association, Annual Convention, Waldorf-Astoria, New York City.

Feb. 20-23—Technical Association of the Pulp and Paper Industry, Annual Convention, Roosevelt Hotel, New York City.

Feb. 20-24—American Paper and Pulp Association, 62nd Annual Convention and Meeting, Waldorf-Astoria, New York City.

Feb. 21—Salesmen's Association of the Paper Industry, Annual Meeting and Luncheon, Waldorf-Astoria, New York City.

March 7-10—American Management Association, Ninth Packaging Exposition, Hotel Astor, New York City.

April 17-19—First Annual Paper Festival, Savannah, Georgia.

June 11-14—Twenty-First Annual Convention and Buyers' Fair, National Paper Box Manufacturers' Association, Hotel Astor, New York City.

June 13-15—American Pulp and Paper Mill Superintendents Association, Wardman Park Hotel, Washington, D. C.

▶▶▶ The Desiderio interests, which include the scrap paper company and the three mills, are almost entirely a family affair of ownership and management. William A. White is superintendent of the Clifton mill, but Anthony is president of this and the other companies. Thomas, the eldest son of the family, manages the Whippany plant. Dominick, the third in line, is in charge of all purchasing and production. Arnold handles the waste business and trucking. John, graduate of the Ohio State University law school, is counsel for the companies. Salvatore, sixth in the list, is in charge of receiving and shipping and Michael, the youngest, recently graduated by the Wharton School of Business, University of Pennsylvania, is office manager.

▶▶▶ But what of Frank Desiderio, who came from near Naples, thirty-four years ago, and bought himself a pushcart to collect scrap paper? The day a delegation visited the new Clifton mill under leadership of the Austin Company, engineers, and Bagley and Sewell Company representatives, there was a warm and enthusiastic welcome by Anthony and the other Desiderios, but the pioneer who founded this enterprise was too ill to join them. Still, the vision and hard work and energy of a young man from Naples was there in spirit, for it's a long road to travel from a pushcart full of scrap paper to one of the most modern paperboard mills in the country. Frank Desiderio has done a swell job both in his family and in the paper business.

Automatically MAINTAINING LOW DELIVERY PRESSURES WITHIN CLOSE LIMITS

CASH STANDARD Type 34 PRESSURE REDUCING VALVE

CASH STANDARD *Type 34*

PRESSURE REDUCING VALVE

This is a direct operating, direct acting, pressure reducing valve that receives the *variable*, high inlet pressure—automatically reduces it to a lower delivery pressure—and dependably maintains the reduced pressure . . . It is applicable to pressure control of Steam, Hot or Cold Water, Air, Oil, Brine and most liquids and gases.

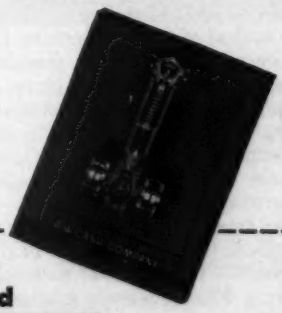
No Lost Motion . . . No Loose Joints . . . The inner valve is directly actuated by the diaphragm, which is particularly sensitive, due to its large area. There is no appreciable wear on the diaphragm stem or packing, because perfect stem alignment is always assured by a set of two Nitralloy 3-roller guides, which kill side strains on the valve stem.

Made in twelve sizes . . . equipped with Air Cooled, or Water Cooled Packing Boxes . . . for high temperature use

Investigate the production economies assured by the design and construction of Cash Standard Type 34 Pressure Reducing Valves.

A. W. CASH COMPANY

DECATUR • • ILLINOIS



CASH STANDARD CONTROLS . . VALVES

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***FREE*—Valuable, quick reading, accurate tables and capacities for Steam, Air, Gas, Water and other liquids are contained in Bulletin No. 34 . . . Send for your copy today.**

ALLIED

HERCULES POWDER TO BUILD ETHYL CELLULOSE PLANT

A new plant for the production of ethyl cellulose is to be erected at Hopewell, Virginia, by the Hercules Powder Company, Inc., it was announced recently by officials of the firm. Construction of the plant inaugurates the first step in an expansion program for the manufacture of ethyl cellulose which, at present, is produced at the Hercules Experiment Station near Wilmington, Delaware. Transfer of all cellulose manufacturing activities to Hopewell will be made as soon as the new plant is completed.

The Hercules Powder Company has already under construction at the Hopewell site a new electrolytic caustic chlorine plant, and inasmuch as large quantities of sodium hydroxide are used in the manufacture of ethyl cellulose, the proximity of the new plant to this convenient supply of caustic is advantageous.

Ethyl cellulose is much lighter in weight than other cellulose compounds and can retain flexibility at extremely low temperatures in addition to being tough, resistant to alkalies and weak acids and widely soluble in most solvents. It is used in lacquers, varnishes, plastics, synthetic finishes, textiles, films, paper and many other products.

◆

IPI CONTEST GOES TO JURY

National winners of the Third Annual IPI Essay Contest on Color are in the process of being chosen by a jury headed by Harry L. Gage, vice-president of the Mergenthaler Linotype Company, Inc., it was announced recently. Local winners in the contest sponsored by the International Printing Ink Corporation and the National Graphic Arts Education Guild have been selected at the 312 schools of printing participating in the contest. National prizes in the Essay Contest include two trips to either of the 1939 World's Fairs. Other national prizes are a $400 university scholarship and $50 in cash.

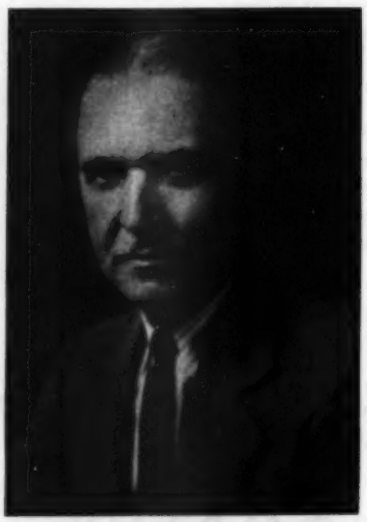
The Advisory Committee for the contest includes many names well known in the graphic arts, in addition to the heads of the New York and San Francisco Fairs, respectively, Grover A. Whalen and Leland W. Cutler. Fred J. Hartman, educational director of the National Graphic Arts Education Guild, is chairman of the Essay Contest Committee.

◆

NEW CHEMICAL SUPPLY COMPANY

The Chemical Supply Company, a new organization dealing in industrial chemicals and mill supplies, was recently established at Neenah, Wisconsin, and will serve paper and pulp mills in the Fox River Valley in addition to all points in northeastern Wisconsin and Upper Michigan. The company's territory also extends as far south as Fond du Lac and Sheboygan.

The new chemical firm is headed by Eric D. Lindberg who, for the past twenty-five years, has been associated with the Patten Paper Company, Ltd., of Appleton, Wisconsin. Mr. Lindberg, who is president and treasurer



Eric D. Lindberg

of the recently-organized company, was general manager of the Patten firm until it was sold to the Fox River Company a year ago. William C. Comee, Jr., formerly sales manager of the Northern Chemical Company of Green Bay, is now vice-president and secretary of the new company.

The Chemical Supply Company's location at Neenah will enable the firm to service the many industries in the immediate area as well as those operating in the Wisconsin River Valley. Due to the fact that the Wisconsin Paper Group has its offices and assembly warehouse in Neenah and Menasha, many shipments of paper are delivered there for assembly in pool cars. Thus paper mill trucks can pick up chemicals when they are delivering paper to the group. The new company has the only general chemical warehouse north of Milwaukee and sells and carries in stock all the standard chemicals used by pulp and paper mills.

◆

WESTINGHOUSE "PACKAGES" AIR CONDITIONING

A complete line of "packaged" self-contained air conditioning units for commercial establishments has been announced by the Westinghouse Electric and Manufacturing Company. These new units, ranging in capacity from one to fifteen tons and in combinations up to thirty tons, are a complete air conditioning system packaged in a compact enclosed cabinet. All that is necessary for operation are power, water and drain connections. Every unit can be carried through a three-foot door opening—the largest occupying only 2 feet, 10 inches.

The units of the new line are easily adapted to winter air conditioning by the simple installation in the cabinets of the necessary accessories such as heating coil and humidifier, thereby providing year-around air conditioning.

◆

CRANE COMPANY HOLDS OPEN HOUSE

Inspired by a notable expansion in its research and engineering program, the Crane Company, Chicago, recently held an Open House at which time there was revealed to the public the research work which goes on behind the scenes in the plant of this large manufacturer of valves, fittings, plumbing and heating equipment and pumps.

Although research work has been a part of the Crane program for a half a century, it has been continually enlarged until today it occupies two two-story buildings with a total floor space of 86,000 square feet and a personnel of 285. The staff ranges all the way from experts in metallurgy to specialists in the field of ceramics, a body of engineers spending their entire time in the work of controlling the quality of present products and looking ahead to their improvement.

Among the various research activities in progress at the Crane Company are those which have to do with valves, fittings and fabricated piping. These

items are subjected to tests as high as 50,000 pounds per square inch with strain gauges located to determine accurately the amount and location of strain. Other observations made in this laboratory are high temperature tests, service tests, flow of liquids and pipe bends.

Also of special interest is the ceramics laboratory where there is complete equipment for the smelting of enamels for test purposes, sand blasting and spraying apparatus, pebble mills, magnetic separator, a multiple reflectometer for measuring enamel gloss, tests for abrasion resistance, a surface abrasion tester, a petrographic microscope for the minute examination of ceramic materials and materials for testing the effect of acids and alkalies on enamels.

At the recent Open House, tour visitors, including scientists, engineers, directors of research, educators, business executives, etc., were taken through the Chicago Works, following the laboratory visit.

◆

HOOKER TO BUILD NEW OFFICE UNIT

A new office and administration building is to be erected by the Hooker Electrochemical Company in connection with its main plant at Niagara Falls, New York. When completed some time this year, the company's principal executive offices will be transferred from the Lincoln Building, 60 East 42nd Street, New York City, to Niagara Falls. The company will continue to maintain a New York office.

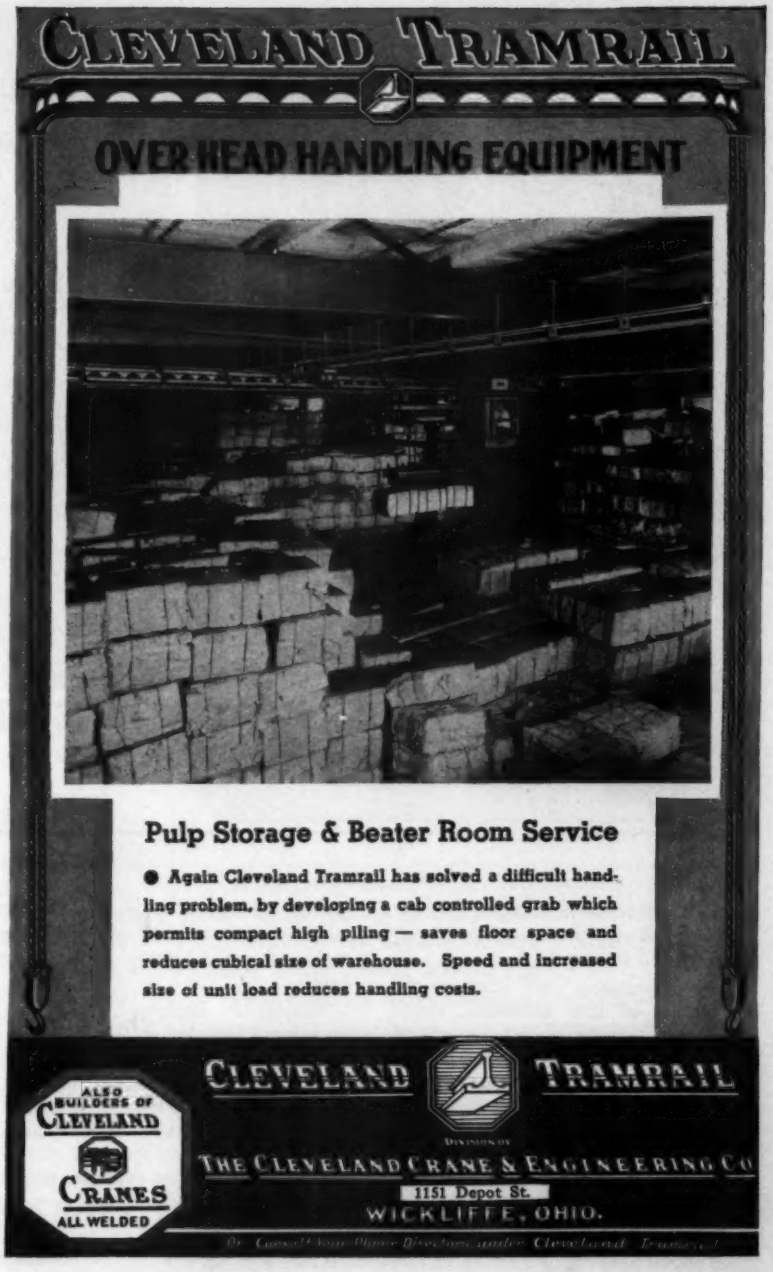
It is understood this move is being made to concentrate the supervision of operation, sales, research and development at one place for better service and greater efficiency.

◆

2200 VETERANS IN GOODRICH CO. PERSONNEL

Over 2,200 men and women have been with the B. F. Goodrich Company one-fifth of a century or longer, it was revealed recently at the ninth semi-annual pin presentation ceremonial of Goodrich's Twenty Year Service Club.

President S. B. Robertson of Goodrich presented 189 pins to the latest group, which was composed of employees who have completed their 20th service anniversaries since last June. Mr. Robertson also awarded 30-year pins to 222 employees who have more than 30 and less than 40 years of service and two 40-year pins to employees who have recently entered this classification.


CLEVELAND TRAMRAIL
OVER HEAD HANDLING EQUIPMENT
Pulp Storage & Beater Room Service
● Again Cleveland Tramrail has solved a difficult handling problem, by developing a cab controlled grab which permits compact high piling — saves floor space and reduces cubical size of warehouse. Speed and increased size of unit load reduces handling costs.
ALSO BUILDERS OF CLEVELAND CRANES ALL WELDED
CLEVELAND TRAMRAIL
DIVISION OF
THE CLEVELAND CRANE & ENGINEERING CO
1151 Depot St.
WICKLIFFE, OHIO.

ROBERTS RETURNS FROM WORLD TOUR

Recently returned from a round-the-world trip is J. F. Mitchell-Roberts, export manager for Oliver United Filters, Inc. Mr. Roberts covered practically every country in which the company had business interests with the exception of those in Latin America which he expects to visit a little later.

In all, Mr. Roberts travelled about 78,000 miles, returning with a comprehensive picture of the industrial situation in foreign countries, particularly the Far East. He visited not only all the company's agents but also many plants in connection with paper, mining, chemicals, petroleum, sugar, and sewage in which Oliver United Filters are being used.

◆

ARMCO GOES ON THE AIR AGAIN

A new series of radio talks by the American Rolling Mill Company's widely-known "Ironmaster" will begin January 15 at 3 P.M., E.S.T., on a coast-to-coast hook-up of 42 N. B. C. blue network stations. "What industry means to the average man and his

"NON-USERS ARE THE LOSERS"

TENAX FELTS

FINISH AND TRIM

A Challenge to 1939

Check another completed year of Satisfactory Service for TENAX FELTS - - - - - - Keeping constantly abreast of changing methods and conditions, the makers of TENAX FELTS pledge themselves, during this new year, to add another milestone to their record of Cooperative Endeavor and Enduring Accomplishment.

"Non-Users Are The Losers"

LOCKPORT FELT COMPANY

NEWFANE, N. Y.—U. S. A.

family" will be the keynote of the new series of talks which will remain chatty, friendly and informal.

The "Ironmaster" will interpret the advantages of free individual enterprise and the American competitive system. His talks will also show why opportunities for leadership in American industries are greater than ever before. The talks will be featured midway in the broadcasts, which for the tenth consecutive season will feature the popular Armco Band under the direction of Dr. Frank Simon.

◆

ULTRA SPEED PHOTOGRAPHY DEMONSTRATED

A new process of ultra speed photography was demonstrated recently at A. G. Spalding & Bros., New York. The process has been developed by Dr. Harold E. Edgerton of Boston and Arthur D. Little, Inc., consulting engineers, in conjunction with the research laboratory of the Spalding firm The process, which is being shown for the first time, is said to have revolutionary possibilities not only in its applicability to the sports field in the photographing of flight and impact, but also in its relation to the photography of rapid motion in any other field.

Charles F. Robbins, president of Spaldings, presided at the demonstration and introduced Raymond Stevens, vice-president of Arthur D. Little, Inc., and Dr. Edgerton, who described the scientific angle of ultra speed photography. By the new process pictures can be taken with an exposure time of 1/100,000th of a second.

◆

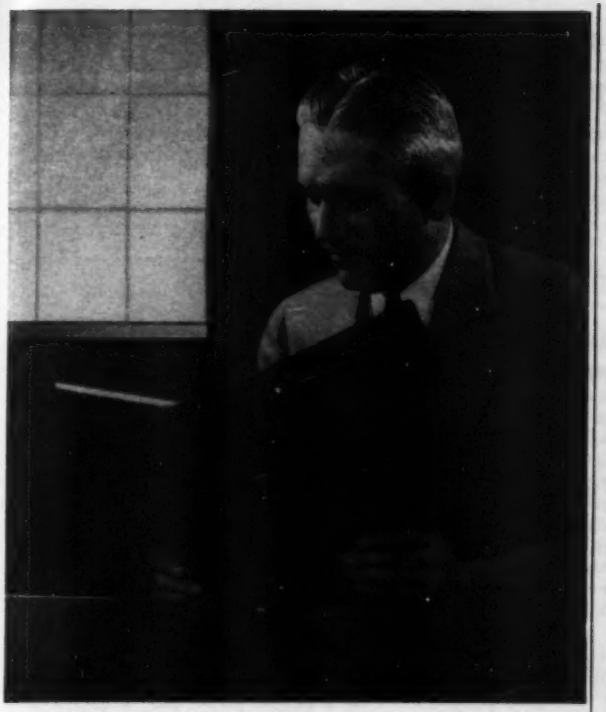
MOORE CORP. AND F. N. BURT NOW MERGED

The F. N. Burt Company and the Moore Corporation, both of Canada, were amalgamated on December 31 and the new company is now known as Moore Corporation, Ltd. Under the terms of the plan, the charter of the new company is practically the same as the charter of the former Moore Corporation. Shareholders of F. N. Burt Company and the Moore Corporation received shares of the new company as follows: (1) For each share of Burt 7 per cent convertible preference stock, holders received one convertible class "A" preference share of the new company; (2) for each four shares of Burt common, stockholders received three shares of common stock of the new company, and (3) holders of Moore Corporation, Ltd., preference and common shares will continue as shareholders of the new company without any change in their holdings. The rights and privileges attached to the preferred shares were not altered in any way.

◆

CHINA CLAYS PLANT TO START IN SPRING

The newly-established plant of Canada China Clay, Ltd., near Lac Remi, Quebec, will start production about April 1, according to a letter just issued to shareholders. The company's output is expected to be absorbed in the fine paper industry supplying a fine clay product hitherto imported. It is expected the plant and equipment will make necessary a total investment of about $450,000, of which about $393,816 had been expended up to November 1. Delivery of the balance of the equipment for the clay mill and silica mill is expected shortly.



Well, that IS interesting!

● This executive is interested in the photograph portfolio a Lewellen representative has opened on his desk. His engineering experience gives him a genuine appreciation of Lewellen's leadership in the unusual applications of variable speed control.

His problem, like yours, is that of improving his product and reducing unit costs. He knows that efficient, regulated speed control of production machines is a necessity.

Perhaps your production problem that concerns the correct application of speed control is a simple one. If so, a standard Lewellen Transmission is the answer. Whether your problem is simple or difficult, you'll not be obligated for the special advice and counsel of Lewellen engineers.

Call a Lewellen Representative or Write Us NOW!

LEWELLEN MANUFACTURING CO., COLUMBUS, INDIANA

Lewellen knows speed control

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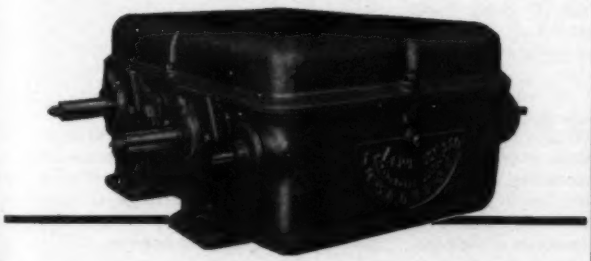
LEWELLEN

***Variable Speed* TRANSMISSIONS**



REDUCE PIPING COSTS AS MUCH AS 25%

Whether it's a new line or a replacement—you can reduce its cost up to 25%, install it faster and save the trouble and expense of future maintenance by using Armco Spiral Welded Pipe.

First costs are lower because Armco pipe is "tailored" to fit your individual requirements. Standard or special fittings come already welded to straight pipe runs. This eliminates a pair of flanges at every bend, saves hours of tedious assembly. Fewer gaskets mean less chance for leakage, lower maintenance costs. Then too you gain years of high operating efficiency because Armco pipe is smooth inside and its wall thickness is uniform throughout. There are no threads to weaken the metal and invite corrosion.

Order Armco Spiral Welded Pipe in diameters ranging from 6 to 36 inches; wall thicknesses from 7/64 to ½ inch. Specify either ARMCO Ingot Iron or steel with your preferred coating, including galvanized after fabrication. Just address The American Rolling Mill Company, Pipe Sales Division, 211 Curtis Street, Middletown, Ohio.

ARMCO

ARMCO SPIRAL WELDED PIPE

NEW EQUIPMENT AND SUPPLIES

Safety Clothing

The use of chloroprene rubber, neoprene, in clothing and hoods worn for protection against hazardous liquids and fumes has been announced by the Rubber Chem-

ical Division, E. I. du Pont de Nemours & Company, Wilmington, Delaware. According to the announcement, a suit made of neoprene coated fabric showed no deterioration after five and a half months of hard usage in a sulphuric acid plant.

Barge-Mounted Barking Drum

A standard 12 ft. diameter by 45 ft. long Canadian barking drum mounted on a steel barge to permit the drum to be moved from one location to another by water has been announced. The barking drum, fabricated by Horton Steel Works, Limited, Fort Erie, Ontario, was installed on the barge together with accessory equipment at the plant of Canadian Vickers Co., Montreal, Quebec, where the barge also was built.

The barge is 100 ft. long, 30 ft. wide, 9 ft. deep, with a maximum draft of 5 ft.

The accessory equipment includes a 265-hp. Diesel engine, a 15-kw. generator,

a 1,000-g.p.m. pump, a 20-hp. Diesel engine, a 12-kw. generator, a bilge pump, a wood handling conveyor system and two knot borers, as well as equipment for a small machine and blacksmith shop.

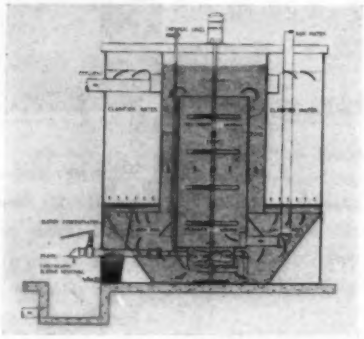
The 265-hp. Diesel engine drives the drum, the supporting framework for which is an integral part of the barge framing, the 15-kw. generator and the 1,000-g.p.m. pump; the 20-hp. Diesel engine, the 12-kw. generator and the bilge pump. The water supplied by the 1,000-g.p.m. pump is used for washing the wood at the discharge end of the drum and for sluicing the bark from outside the drum away from the barge.

Space also is given on the barge to living accommodations for a crew of 14.

In the building of this barge-mounted barking drum unit, John Stadler served as consultant and W. F. Fletcher & Company as naval architects and designers.

Water Softener for Industrial Application

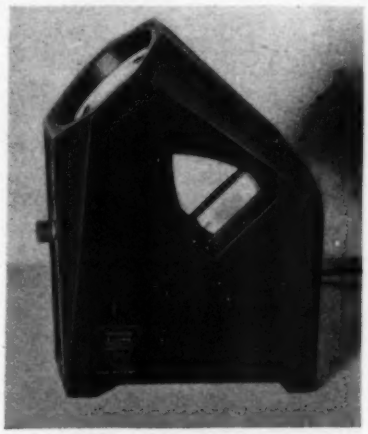
International Filter Co., 59 East Van Buren St., Chicago, has announced the availability of its water softener, known as the Accelerator, in a wide range of capacities. This softener consists of a steel, concrete, or wood tank which is round or polygon-shaped in cross-section. The interior of the tank is so arranged that raw water enters a primary mixing and reaction zone. Here it is mixed with a chemical-slurry mixture which is obtained by adding chemicals to slurry precipitated from previously treated water. Through-put water and slurry are forced upward from the primary mixing and reaction zone through a



secondary mixing zone, formed by a central draft tube, and overflows from the central tube into a secondary reaction zone, formed by an outer draft tube that encircles the central tube. Passing downward through the outer draft tube, the through-put water and slurry is discharged from the tube into a slurry pool at the bottom of the treating tank. From this pool the slurry is again drawn back into the primary mixing zone under the skirt of the central draft tube; while the sludge is discharged continuously from it through a slurry concentrator that is positioned at one side of the tank and extends upward from its bottom. Separation of clarified water takes place continuously over the entire area of the slurry pool, the rate of escape being equal to the rate of in-put of raw water and the discharge being made through collecting troughs, launders or pipes positioned near the top of the tank. A system of drain piping provides means for emptying the tank when necessary. Advantages of this softener, according to the manufacturer, include more complete and rapid softening of the water, lower cost, and smaller space requirements than ever were possible with previous methods or facilities.

Film Slide Viewer

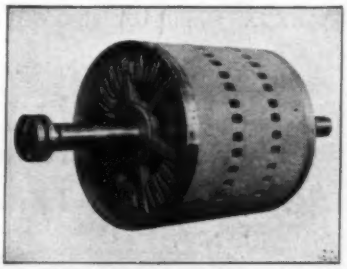
Bausch & Lomb Optical Company, Rochester, N. Y., has developed a film slide viewer for the examination of slides or films. The instrument consists primarily



of a molded plastic case, a ground glass diffusing screen, a precision lens, and an illuminating system. The molded plastic case is supplied in any one of three colors—brown, green, or black. The ground glass diffusing screen is approximately 2 inches square; while the lens is 3 inches in diameter. The viewer operates on 110 volts, A. C. or D. C., and uses a standard 15 watt Mazda bulb. Either permanently mounted slides, or films in cellophane containers or patented holders can be viewed in it.

Magnetic Pulley Improvements

The Stearns Magnetic Mfg. Co., formerly Magnetic Mfg. Co., Milwaukee, Wis., has announced some improvements in design of its Stearns High Duty magnetic pulley. Among these improvements are: a new ribbed construction to allow for greater radiation area and deeper coil pockets which



permit more copper wire and more ampere turns with subsequent greater magnetic strength; improved system of air ducts; non-magnetic end rings of special alloy steel which extend beyond the active face of the pole and are machine fitted to the end poles; and weather-proof construction. This pulley is furnished in a wide range of diameters and face widths to accommodate any type of existing conveyor system.

Automatic Safety Collar

Gilbert & Nash Company, Menasha, Wisconsin, has announced the development of an automatic safety collar for the spindling of rolls. This collar, the result of a long series of tests and research, operates automatically with applied tension. Likewise, as soon as the web breaks, it locks auto-

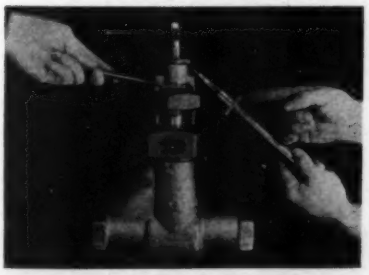
matically in the opposite direction. The locking arrangement also provides for positive affixing of the collar to prevent any side slipping on the shaft. When tension is relieved, the collar unlocks itself and, as a result, it can be released immediately without the use of any wrenches or hammers.

Anti-Foaming Agent

A special grade of capryl alcohol, trademarked Diafoam, has been announced by The Resinous Products & Chemical Co., Inc., 222 West Washington Square, Philadelphia, Pa., for use as a defoaming agent in the manufacture and coating of paper. This product is suggested by the manufacturer for use in beaters, in stock lines, in head boxes of paper machines, and in color boxes of paper coating machines. Claims made for Diafoam include the following: more effective than commonly used foam deterrents; no fisheyes result from its use; leaves no residual odor in final stock; and gives smoother colors.

Valve Design Improvement

The Hancock Valve Division, Manning, Maxwell & Moore, Inc., Bridgeport, Connecticut, has announced a design improvement in its line of forged and cast steel valves. This improvement incorporates both the construction and the material used in a renewable stem thread bushing. Duronze,



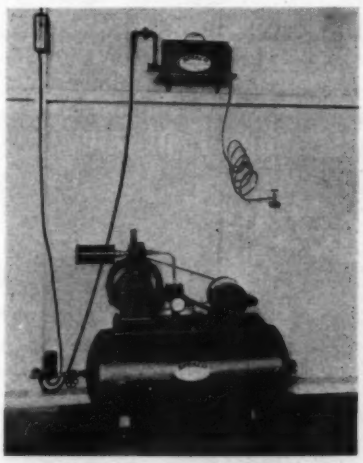
an aluminum copper silicon alloy, is used for the part. The manufacturer states that this bushing has an exceptionally low coefficient of friction, a very high resistance to wear and corrosion, and a tensile strength of 90,000 lb.; and claims that it meets the demand for valves that will operate satisfactorily without lubrication of the stems at elevated pressures and temperatures.

Mechanical Cleaner Design Changes

Whirlflex Sales, Inc., 801 White Building, Buffalo, New York, has announced some additions and improvements to its mechanical pipe and open surface cleaner. According to the manufacturer, these changes have improved the ease of operating the machine as well as increased the life of the unit. The standard model "80" Whirlflex, for pipes from 3 in. to 14 in. in diameter, has a working radius for pipe cleaning of 80 ft., and includes an open surface attachment with a flexible working radius up to 60 ft. This attachment, adding considerably to the versatility of the unit, is suitable for removing scale and old stock accumulation from beaters, beater bars, stock chests, screens, etc. A new model, designated as "40," has a working radius of 40 ft. for pipe cleaning in diameters from 3 in. to 14 in., and does not include an open surface cleaning attachment.

Humidifier

Spray Engineering Company, 149 Central St., Somerville, Massachusetts, has developed a humidifier for laboratories, stock rooms, etc. with room sizes up to 4000 cu.

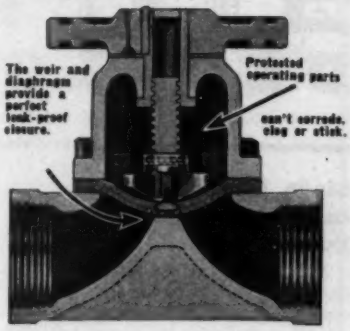


ft. The humidifier incorporates into its design a spray head, compressor, constant level water supply tank, and electrical humidistat. The spray head is connected to the compressor and the constant level water supply tank; and is automatically controlled by the electrical humidistat. The unit, operating from any lighting circuit, according to the manufacturer, will deliver a finely atomized spray, which is completely absorbed by the atmosphere without precipitation or drip; and will maintain relative humidity constant within one per cent over a wide range of operating conditions.

New Wax Size

A wax size, named Nopco Base Oil 1765, has been announced by the National Oil Products Co., Harrison, N. J. The manufacturer suggests its use with rosin as an improved beater size, with starch for tub sizing, in water boxes on calender stacks, for blending with coating agents, and for the sizing of paper on the alkaline side. Among the advantages cited for it by the manufacturer are: improved finish and flexibility, increased sizing without increased brittleness, improved printing qualities due to improved finish, greatly improved quality feel, non-curl or buckle, and use of direct dyes in connection with alkaline sizing.

A STOCK LINE VALVE
that does not Leak



Saves Time, Trouble and Money

This Valve is applicable to all services in Paper Mills, where the temperature does not exceed 200° Fahrenheit. Available in sizes from ½" to 14". Bodies made of stainless steel, bronzes, or cast-iron, lined with rubber, glass, or lead.

Send for data and state your fluid handling problem.

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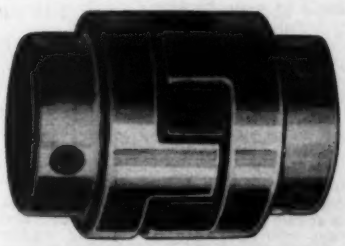
HILLS-McCANNA
SAUNDERS' PATENT
VALVES for CHEMICALS AIR · WATER

Safety Flexible Coupling

A flexible coupling, designated as L-R Type 1-A Safety Coupling, has been developed by the Lovejoy Flexible Coupling Co., 4947 W. Lake St., Chicago. The body



of this coupling is made of Tobin bronze, a metal which will not spark under any conditions; while the spider or resilient load cushion is made from rubber, duck, leather, or a brake lining material of woven asbestos. The coupling is made in standard sizes with bores from 1 in. to 2¼ in. inclusive (2 hp. to 90 hp. at 1750 r.p.m.).

TECHNICAL DEVELOPMENTS

The following abstracts are of the latest developments found in the foreign press.

Sieve Analyses in Mechanical Pulp Evaluation

After making a thorough search of the literature (with 29 references) the authors show that there is still a wide disagreement regarding the value of screen (or sieve) analysis of a mechanical pulp suspension as a determinant of the properties of test sheets made from such pulp. The purpose of the present thorough study (a doctor's dissertation of one of the authors) is to decide on the adequacy of such mechanical analyses. Experiments were made in the so-called Research Flour-tester of Klem-Hurum, shown in Figure 1 (the workings of which have been described in Papierfabr. 1932, p. 109). In the illustration, (a) is the container; (b) is the twirling device; (c) the belt pulley; (d) base of the casing; (e) the screen plate; (f) a three-way stop-cock; (g) the seal; (h) a float. The operations and technique are given in detail using Klem's recommendation of a sample of 4 grams of pulp (calculated on the bone dry basis), and 2 or 3 screens (of varying mesh) were used. Propeller rotation was 275/min. and the number of washings were seven. The per cent of the most finely divided mechanical pulp was calculated from the formula $F = (a\text{-}x)100/a$; where $a =$ weight (in g.) of the bone dry sample, and $x =$ weight (in g.) of bone dry screen residue. The conditions for weight of sample, screen mesh to be used, number of washings required, and for screening groundwood of varying slowness, were carefully determined. The results of these investigations are tabulated. Figure 2 shows the fiber selection apparatus H.S. (Fasergruppierungsapparat H.S.) which was the other piece of equipment used in separating fibers from fine stuff. Here (a) is the water inlet, (b) the cock for venting dirty water, (c) device for inserting a filter screen, (d) manometer, (e) stop-cock, (f) propeller, (g) washing receptacle, (h) sieve bottom with sieve (which may be swung), (i) swinging overflow receptacle, (k) valve serving to empty (i) and (l) draining funnel. Here, too, the amount of sample to be taken, the washing period, and the pressure of the wash water, etc., were determined by experiment. The most favorable conditions were: 2 g. (bone dry) sample, a 6 minute washing period, with a pressure of 1 atmosphere, a water height (Stauhöhe) of 50 mm. Under these conditions, when No. 80 and No. 100 screens were used, there was excellent agreement between per cent (F) for both pieces of apparatus. Unfortunately, it was found that in certain stocks showing very different freeness and markedly divergent strength of test sheets, very nearly the same per cent screen fractions were obtained. This is accounted for by the fact that with the very finest screen used a residual "finest fraction" is obtained, which contains not only fiber fragments but also slime stuff, which has a marked bearing on the properties of the finished sheet, and for the composition of which no method of estimation exists. It is possible then that at one extreme this finest fraction is pure slime, and that at the other extreme it is made up of fiber fragments, while between these limits are an indefinite number of mixtures. The total amount of this finest fraction may be the same in some cases and still impart very different properties to the pulp sheet. Evidently screen analytical data alone are insufficient to evaluate the pulp. It is therefore necessary, in interpreting mechanical pulp analyses, to take into consideration the conditions of

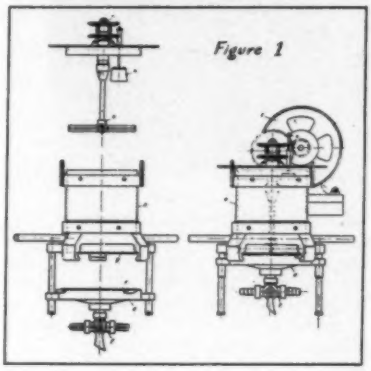


Figure 1

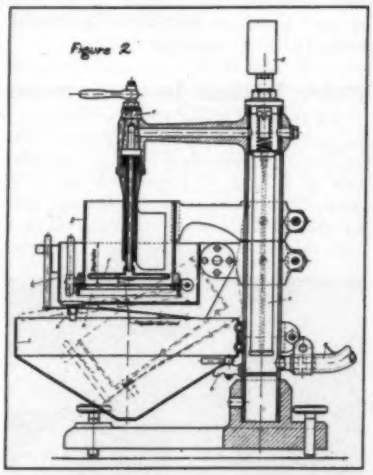
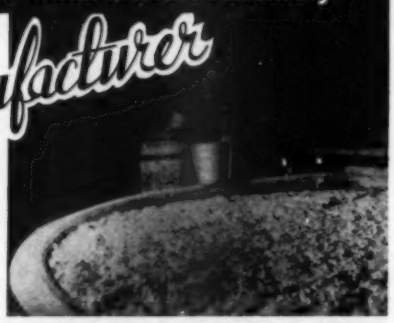


Figure 2

How To Operate Paper Mills More Profitably

Mr. Paper Manufacturer



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. . . Cuts beating time up to 40%.
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. . . Cuts filler and sizing costs, through better retention.
. . . Conditions stock more quickly.
. . . Permits larger use of wax paper in scrap stock.
. . . Makes water penetrate and open up fibre bundles more rapidly.

These are but a few of the production savings and product improvements that important mill operators are making regularly with MAGNUS BEATEX. Let a Magnus paper expert demonstrate how MAGNUS BEATEX will help you make money . . . in your own mill, under your own operating conditions, at no cost to you!

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2—Magnus Feltex
3—Magnus Beatex
4—Magnus Suction Press Roll Cleaner
5—Magnus 258
6—Magnusol

MAGNUS CHEMICAL COMPANY
Manufacturers of Cleaning Materials, Industrial Soaps, Metallic Soaps, Sulfonated Oils, Emulsifying Agents and Metal Working Lubricants.
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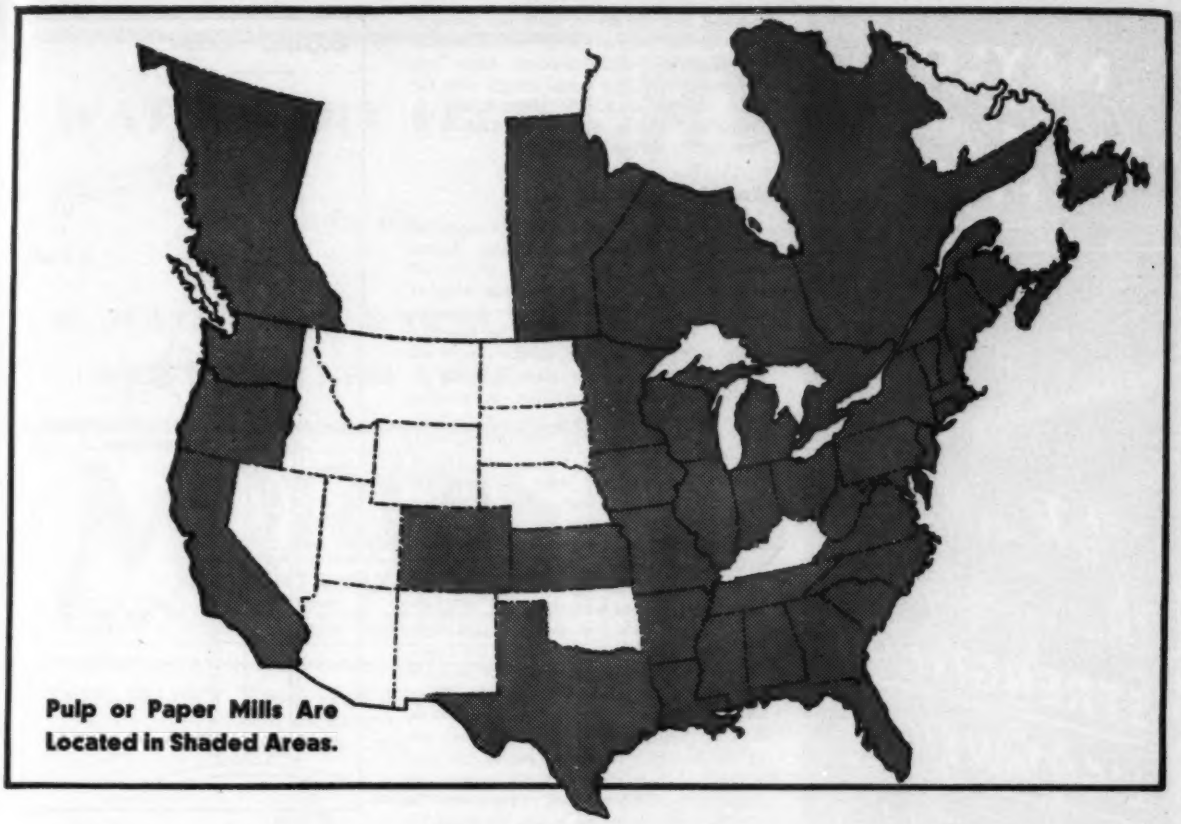
Magnus CLEANERS



Pulp or Paper Mills Are Located in Shaded Areas.

Wherever there's a pulp or paper mill— Stebbins Linings and Tanks are favorably known

From Newfoundland to California – from British Columbia to Florida—wherever there's a pulp or paper mill on the North American continent, Stebbins linings and tanks stand first in the esteem of the most experienced men in the pulp and paper industries. In a large majority of the pulp and paper mills one or more vessels are equipped with Stebbins linings and in many plants Stebbins linings are used exclusively. Over 90% of all the sulphite digesters in the country are Stebbins lined, and in countless accumulators, acid towers, acid recovery tanks, acid storage tanks, bleaching tanks, blow pits, chests, washer vats, etc., Stebbins materials and mastercraftsmanship play a most important part in assuring long life and efficient, economical, trouble-free service.

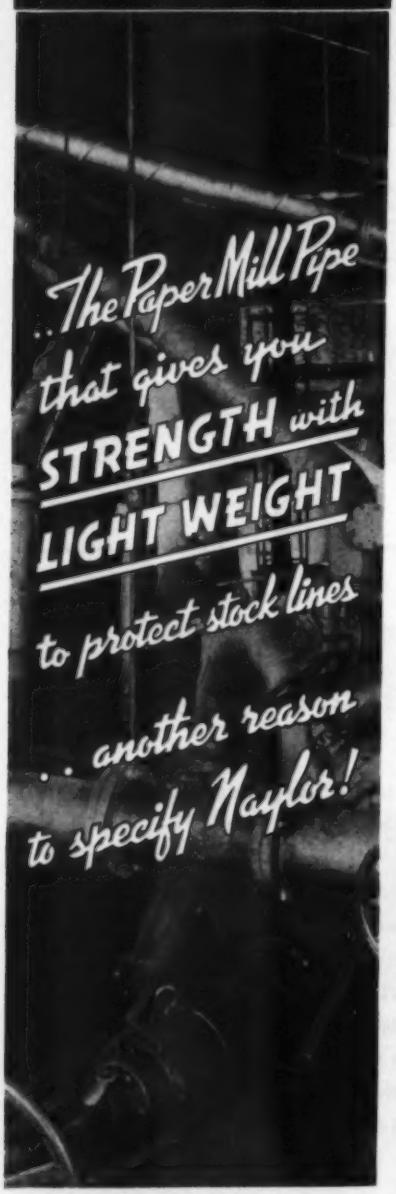
If you are not already a user of Stebbins linings it will pay you to talk your lining problems over with one of our engineers. Over 50 years experience in the pulp and paper field renders us exceptionally well equipped to serve you.

SEMCO

Stebbins Engineering and Manufacturing Company

WATERTOWN, NEW YORK

NAYLOR
Lockseam Spiralweld
PIPE



Sizes 4 inches to 30 inches in diameter with all types of connections and fittings. Complete fabrication service.

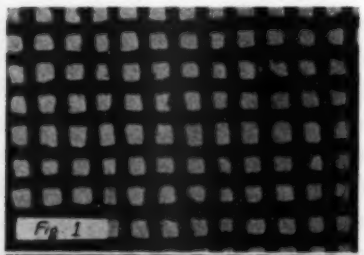
WRITE FOR CATALOG No. 37

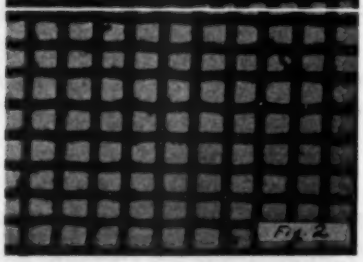
NAYLOR
PIPE COMPANY
1236 EAST 92nd STREET
CHICAGO ILLINOIS

grinding and always to carry out strength tests on the finished pulp sheets, besides examining the pulp suspension. Only then is it possible to gain a real insight into the value of the stock. W. Brecht and R. Trenschel. Papier Fabr. 36 (Tech-Wiss. Tl.) 462-71 (1938).

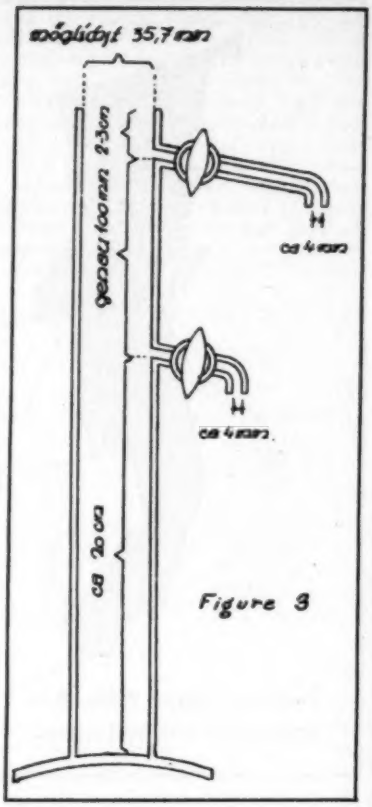
Kaolin Testing

This is a brief report from the Austrian Kaolin and Montanindustry A.G. Screen tests on water suspensions of kaolin are used, and it seems quite immaterial whether tap-water or distilled water is the elutriation means. This has been proved by repeated experiment. Furthermore, similar results are obtained whether water glass is added to the water, causing peptization, or whether papermakers alum is used, causing flocculation. The screen residues remain unaltered. Fifty grams based on the dry weight of kaolin are mixed in a large porcelain dish with 0.5-1.0 liter of water. The suspension is poured through the appropriate screen (the best being one carefully standardized, with 10,000 meshes to the sq. cm., and with open interstices having the width of 0.06 mm.), and washed with 0.33 liter of water, then flushed back into the porcelain dish. The entire procedure is repeated ten times. Finally the residue in the screen is removed to a tared dish, dried and weighed. Where crude impurities (metal, wood splinters, etc.) are present, a screen of 400 mesh per sq. cm. or better 3600 mesh per sq. cm. may be used, but in general these screens are unnecessary. An important point is that the 10,000 mesh per sq. cm. screen has standardized openings for what may happen is demonstrated in the photomicrographs, Figures 1 and 2. Both of these screens are 10,000 mesh per sq. cm., but the thickness of wire varied so that the screen in Fig. I retained 4 per cent of the kaolin while under identical conditions the screen in Fig. II retained only 0.5 per cent of the same kaolin. To determine the fineness of particle size and





the relative amounts of such particles, two determinations of the colloid number and the peptization number were made. By definition the former gives the per cent of the kaolin, which still remains in suspension in distilled water at a height of 10 cm. after



a settling period of two hours. The original suspension is 5 per cent. The peptization number gives the percentage of kaolin still in suspension at a height of 10 cm. after complete initial peptization, after a settling period of two hours. The difference between these two determinations, depends on the use of a very dilute water glass solution in the case of the peptization number. The simple tests are carried out as follows: 25 g. of kaolin are treated with sufficient water to bring the volume to 500 cc. (or in the peptization number determination with a water glass solution made by diluting 100 cc. of a 40 deg. Bé solution to 1 liter, and then using *5 cc. of such a diluted solution*, followed by bringing the total volume of the mixture to 500 cc. by addition of distilled water). The mixture is thoroughly shaken and then poured into a cylinder with two side outlets with stopcocks, as shown in Figure 3. The distance between these stopcocks is exactly 100 mm. and at the end of two hours the suspended liquid above the *upper* stopcock is drawn off. Immediately thereafter the portion of suspension between the upper and lower stopcock is drawn off through the latter, into a weighed evaporating dish. The *dried residue* (A) is weighed and the *volume* in cc. (V) of this portion (between upper and lower stopcock) is accurately determined. Then the colloid number (CN) = 2000 A/V, whereas the analogous peptization number (PN) = 2000 (A—0.06)/V, (where 0.06 is the correction for sodium silicate of the water glass). In many kaolins, the two figures are identical, but in some, which give only traces of residues on a 10,000 mesh per sq. cm. screen, there are great differences

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with much lower CN. The PN is by far the most important in gaging kaolins. With a PN below 20 per cent, a kaolin is of poor grade, while a PN of 40 per cent indicates high quality kaolins and at 70 per cent or more kaolins are suitable for ceramic purposes. Evidently the PN is a measure of particles having radii below 1 mu. Theodor Eder. Wochbl. Papierfabr. 69 (Tech Tl.) 879-882 (1938).

Bleached Sulphite and Sulphate Pulps

Yield curves of bleached sulphate or sulphite pulp reach a flat maximum of 41.5 per cent (when the degree of pulping of the unbleached material corresponds to a Roe number of about 5-6). When the original Roe numbers are higher this does not mean an increase in the yield of bleached pulp. Generally, the yield is practically independent of the degree of cooking. When the Roe numbers are below 5-6, the strength of both bleached and unbleached pulp falls. With bleached kraft it thus becomes evident, from the viewpoint of quality and yield, to cook to a Roe number of 5-6. But this is not a complete solution of the problem. For example, where some sacrifice (say 10 per cent) of strength in the bleached pulp can be made, it may be advisable to cook to a Roe number of about 4 before bleaching, thus cutting down chlorine consumption (about 33 per cent). The alpha-cellulose yields from different kinds of bleached pulp is always about 36 per cent of the original wood substance; of course, on long cooking the pulp will have a high (approximately 90 per cent) alpha-cellulose content. Based on dry wood substance, the yield of bleached pulp from spruce is 2-3 per cent higher than in the case of pine, and the alpha-cellulose is also correspondingly higher (in the case of the sulphite cook). Pulp bleaching is discussed in the light of chlorine number and yield. Up to 2.7 bleaching is satisfactory, the alpha-cellulose content (based on the original wood) remains unchanged. Further bleaching gives a higher per cent alpha-cellulose in the pulp, but at the expense of the actual yield. The author assumes that the higher the lignin content of a given pulp the more hemicelluloses enter solution, and that their solubility in alkali (at the concentrations used) is correlated with their molecular magnitude. The solubility is practically uninfluenced by the chlorination, since the HCl formed does not cause a higher alkali-solubility, and presumably has no hydrolyzing effect under the conditions of bleaching. Two hypotheses regarding the rendering of carbohydrates of the pulp soluble in alkali are advanced: (a) It might be argued that when lignin is chemically split off from the hemicelluloses, the alkali solubility of the latter increases; (b) It may also be that chlorine itself causes a shortening of the carbohydrate chains, giving rise to more soluble products. When lignin-free polysaccharides are submitted to long and repeated chlorination, a decrease in chain length is actually noted, together with an increase in alkali-solubility. However, when a lignin-containing pulp is chlorinated, conditions are different. Here, the low chlorine concentration in the pulp suspension is consumed rapidly, and the carbohydrates are largely protected. This is indicated by the fact that even for various degrees of cooking, the yields of the resulting bleached pulp, and its alpha-cellulose content are respectively constant. The hypothesis (a), which assumes that lignin and carbohydrates are chemically bound in sulphite and sulphate pulp, appears to be confirmed. Erik Hägglund. Finnish Paper Timber J. 1938, No. 15a, 4-6, 8-10-12 (Swedish); through C. A. 32, 9490 (1938); also Bull. Inst. Paper. Chem. 9, 57 (1938).

Sizing of Paper

These are the results recorded in two articles by the same author. Size solutions containing 0.25, 0.5, 1.0, 1.5, 2.0 and 3.0 per cent rosin were used, and 100 test sheets made from each batch. Five tests for degree of sizing were carried out on each sheet. With 1.5 per cent rosin, the most consistent results were obtained, and the maximum deviation from the average degree of sizing was 2.6 per cent. With 0.25 per cent rosin, the deviation was 15 per cent and with 3 per cent rosin it was 9.0 per cent. The degree of sizing appears to be a function of increasing amounts of rosin and of alum, and also of pH in the paper sheets and during the sizing process. Up to 2 per cent rosin, the degree of sizing increases. Thereafter it remains constant. Approximately the same relationship holds for alum. The degree of sizing remains nearly constant for varying pH in the finished sheet, but this is not true for pH during the sizing operation. At 7 deg. C. the degree of sizing is about 33 per cent higher than at 35 deg. Glue appears to increase the sizing effect. Different waters used in the tests were analyzed. These included: distilled water, ice water, tap water, swamp water and water from various industrial plants. Differences in water have a marked effect on the degree of sizing. Freezing distilled water, and then remelting it, does not affect its effect on the sizing, but in tap water this change lowers the sizing effect. This may be due to the separation of colloids during the freezing and to the presence of inorganic salts or organo-metallic compounds. Increasing the hardness of the water, or adding peat extractives, alum, $CaSO_4$, or $FeSO_4$ does not increase the sizing. Poor sizing was obtained with distilled (or rain) water, while the addition of small amounts of waste water or wash water obtained from sulphate pulp bleaching, caused a marked increase in the degree of sizing. Qualitatively, a similar (although less marked) effect was noted when water from sulphite pulp bleaching was used. In his second paper, the investigator used bleached sulphite beaten to 40 deg. S.R. Before carrying out the tests it was established that 1.5 per cent Delthirna size and 2.25 per cent alum gave the best conditions. The results are similar to those recorded above. Water from melted ice (and distilled water) affect sizing unfavorably. In general, water is rendered more suitable for sizing by adding small amounts of organic salts such as those found in sulphate black liquor. Bone glue, under certain conditions, increases the degree of sizing. Sigurd Samuelson. Finnish Paper Timber J. No. 15a, 12-21 (1938); Paper-J. 26, 183-6; 196-200 (1938); through C. A. 32, 9494 (1938).

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SAFETY

Left—Insurance company's safety engineer presents merit certificate to manager of Robert Gair Company's Piermont plant. Left to right: Edmund H. Moore, personnel manager, Piermont; John Fettinger, assistant production manager of box plant; Edward Landry, safety engineer, Liberty Mutual Insurance Company; Dr. S. S. Monteith, chief of staff, Nyack General Hospital; Dennis Hogan, Mayor of Piermont; Norman F. Greenway, resident manager, Piermont plant. (See late item about Mr. Greenway on page 1104.)

AWARD OF MERIT TO GAIR PLANT

The box shop of the Robert Gair Company's Piermont plant, located at Piermont, N. Y., recently received a certificate of merit for having operated 284,865 man hours to November 19, 1938, without a lost-time accident. The certificate, presented by the Liberty Mutual Insurance Company through Safety Engineer Edward Landry, was awarded to Norman F. Greenway, resident manager of the Piermont plant, for the box shop.

Last August the Piermont plant received an earlier certificate of merit covering 286,579 man hours without a lost-time accident. The plant is now striving for a record of one million man hours without a lost-time accident, the award for this achievement being a bronze plaque.

◆

Master Minds of Paper Mill Safety

The photographer happened to peek through the keyhole of one of the National Safety Council offices recently and his camera got a picture of these safety "braintrusters"—the executive committee of the Paper and Pulp Section—deeply engrossed in their work. From left to right around the table are: Arthur Murray, chairman, Engineering-Safe Practice Committee; D. B. Chant, vice-chairman in charge of membership; Ernest Augustus, chairman, Safety Instruction Card Committee; G. W. Phillips, past general chairman; A. Scott Dowd, chairman, Contest Committee; W. Dean Keefer, chief engineer, National Safety Council; E. J. Woodbury, poster director, National Safety Council; W. H. Cameron, managing director, National Safety Council; F. A. Robinson, general chairman, Executive Committee; George E. Burns, safety engineer, National Safety Council; Clayton Braatz, secretary and program committee chairman; M. W. Dundore, Engineering-Safe Practice Committee; Roland W. Richardson, Publicity Committee; C. O. Holmer, Publicity Committee, and J. M. Roche, safety engineer, National Safety Council. (Photo courtesy National Safety Council.)

IDEAS WANTED FOR SAFETY POSTERS

A new sectional poster service has just been offered to the Paper and Pulp Section by the National Safety Council, and D. T. Meany, chairman of the Visual Education Committee, has issued a request for co-operation in maintaining this service.

To produce these sectional posters it is necessary that the sectional chairman and his co-officers be responsible for the ideas and material for each month's poster, inasmuch as the poster service cannot remain in force unless there is material for one poster from the Section each month.

Members should be able to obtain satisfactory material for these posters from past accident experience. A series of safety posters should be developed through a study of the circumstance and causes of accidents in the pulp and paper industry. There is a definite need for such service in wood handling and paper machine departments and other departments that the present type of safety posters issued by the Council does not directly meet. Ideas and materials for the posters should be directed to Mr. Meany at the New Brunswick International Paper Company, Dalhousie, N. B.

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	Hollingsworth & Whitney Co.	Algonquin & Taconnet Mills	Waterville, Me.
GROUP B	Consolidated Paper Corp., Ltd.	Belgo, Shawinigan Falls	Canada
	Crown Zellerbach Corp.	National Paper Products Co. Division	Fort Townsend, Wash.
	Southern Kraft Corporation	Continental Division	Marinette, Wis.
GROUP C	Rising Paper Company	Housatonic	Massachusetts
	Southern Kraft Corporation	Continental Division	York Haven, Pa.
	Strathmore Paper Company	West Springfield	Massachusetts
GROUP D	American Writing Paper Corp.	Riverside No. 2	Holyoke, Mass.
	Bird & Son, Inc.	Phillipsdale	Rhode Island
	The Mead Corporation	Sylva Paperboard Co.	Sylva, N. C.
	The Mead Corporation	The Harriman Company	Harriman, Tenn.
	American Writing Paper Corp.	Nonotuck Division	Holyoke, Mass.
	Spaulding Fibre Co., Inc.	Milton	New Hampshire
	United States Gypsum Co.	North Kansas City	Missouri
	American Writing Paper Corp.	Mt. Tom Division	Holyoke, Mass.
	Central Fibre Products Co.	Vincennes	Indiana
	Hollingsworth & Whitney Co.	Aroostook & Cobbossee Mills	Gardiner, Me.
	Rogers Fibre Company, Inc.	Fibreboard Mill-Div. I	Bar Mills, Me.
	Central Fibre Products Co.	Mt. Carmel	Illinois
	The Mead Corporation	Nashville	Tennessee
	International Paper Co.	Riley No. 23	Riley, Maine
	Hollingsworth & Whitney Co.	Abenaquis Mill	Madison, Me.

Division II—Paper and Board Re-Manufacturing

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The Container Company	Van Wert	Ohio
Container Corp. of America	Anderson	Indiana
Gaylord Container Corp.	Dallas	Texas
Bird & Son, Inc.	Shreveport	Louisiana
Gaylord Container Corp.	Houston	Texas
Bay West Paper Company	Green Bay	Wisconsin

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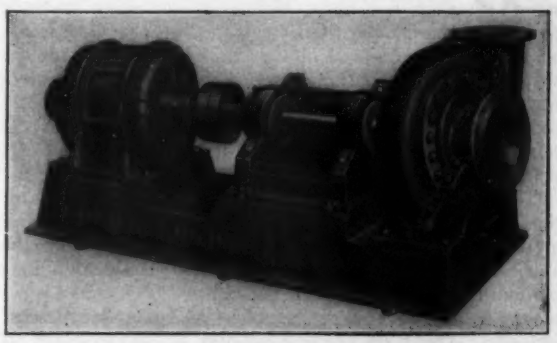

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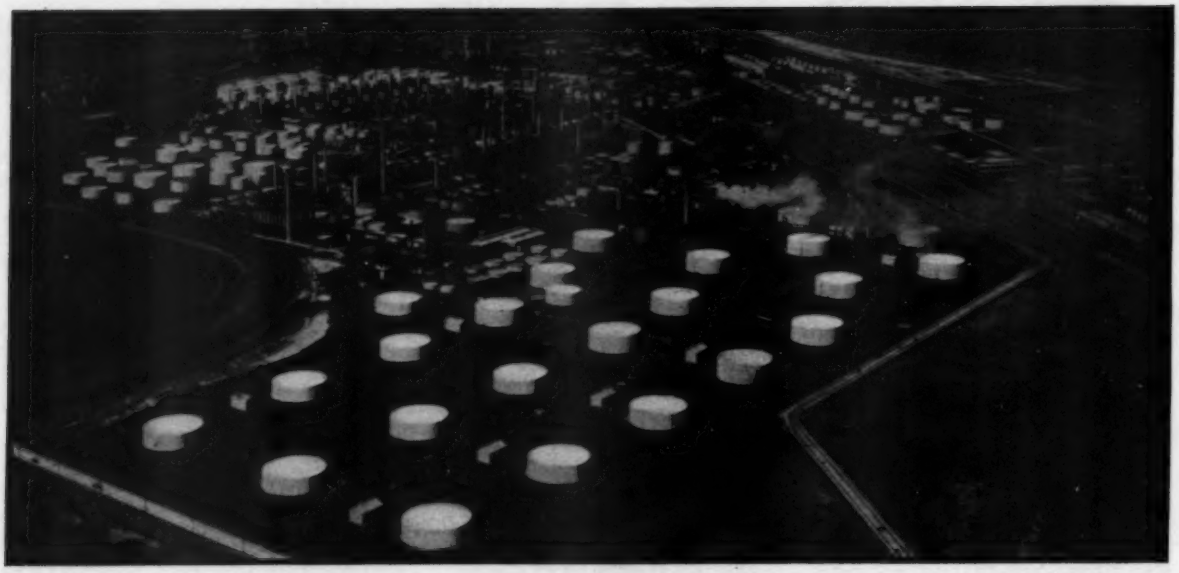


Air view of Whiting (Ind.) refinery, Standard Oil Company of Indiana.

STANDARD OIL (INDIANA) WINS SAFETY AWARD

THAT safety programs in industrial plants *do* work and that accident prevention *does* bring outstanding merit has been proved again. For the second time in five years, the huge refinery of the Standard Oil Company of Indiana, located at Whiting, Indiana, broke the refinery safety record for the second time in five years by completing 3,631,697 man-hours, or 166 days, without loss of time or disabling injury because of accident.

This splendid record—only one of the company's seventeen which won awards from the American Petroleum Institute—is, perhaps, worthy of special note when considered in the light of the natural hazards of the refining industry. The prize-winning refinery stretches for several miles along the shore of Lake Michigan. On the grounds are millions of gallons of combustible elements in a virtual network of pipelines which connect the hundreds of tanks dotting the entire acreage. That conditions such as these did not prevent the refinery from attaining its latest enviable record is in itself, regardless of its other safety successes in other divisions, a worthy tribute to the company's safety program and personnel.

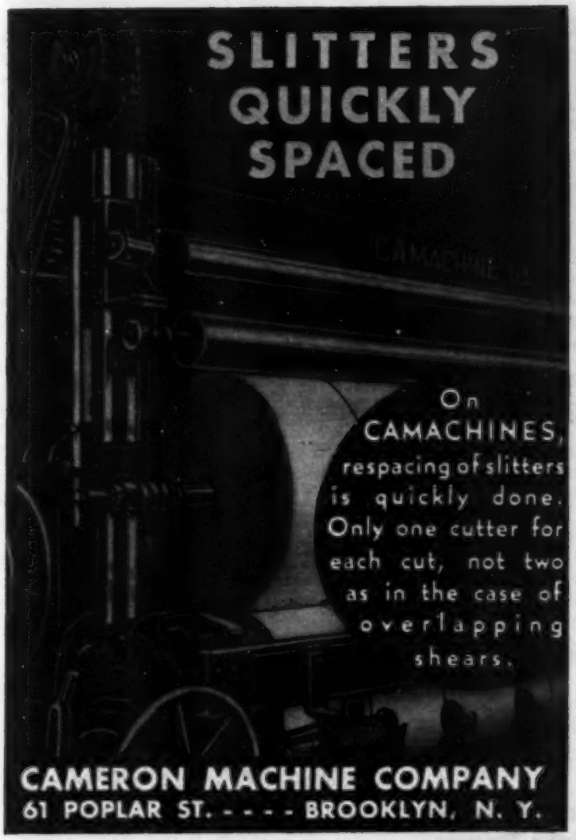
An outstanding record in accident prevention for the wholesale and retail marketing department is also claimed by the Standard Oil Company of Indiana. The company's marketing department won the special award "in recognition of an outstanding record in accident prevention" for the marketing department, wholesale and retail, of the entire petroleum industry. The award was presented to the La Crosse (Wisconsin) sales division which had a perfect no-accident record.

The refining department won seven awards for eleven 1,000,000 man-hour or more safety records. The Whiting refinery had 3,631,697; 2,907,341; 1,164,195; 1,918,514, and 1,653,119 hours. Other records include the Whiting refinery mechanical department which had 3,312,824 hours; the Neodesha (Kansas) refinery with 2,271,754; the Whiting refinery heavy oils department with 1,668,356; the Wood River (Illinois) refinery with 1,324,221; the Casper (Wyoming) refinery with 1,318,426, and the Neodesha refinery mechanical department with 1,209,124.

The marketing department won nine awards for as many 1,000,000 man-hour or more safety records. In this group the Mason City (Iowa) sales division had 2,597,852 hours; Wichita (Kansas) had 2,214,062; La Crosse (Wisconsin) had 1,662,444; Duluth (Minnesota) had 1,397,280; Quincy (Illinois) had 1,240,072; Green Bay (Wisconsin) had 1,202,371; Minot (North Dakota) had 1,177,190; Kansas City (Missouri) had 1,169,388, and Minneapolis had 1,142,739.

Examples of some of the safe practices employed at the Whiting refinery. Left to right: (1) This method of moving cars saved many crushed fingers. (2) Welding blindness avoided. (3) Stop sign on switch track for night work.

SLITTERS QUICKLY SPACED



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Means and Method of Vibrating the Wire of a Paper-Making Machine

Patent No. 2,128,269. Edward W. Smith, Melrose, Mass., assignor to Submarine Signal Company, Boston, Mass., a corporation of Maine. Application September 16, 1935, Serial No. 40,691. 9 Claims. (Cl. 92—45). In combination with a paper machine having a moving wire and a roll supporting the same, means for vibrating said roll vertically comprising a framework, a bearing element carrying the shaft of said roll positioned to move freely vertically in said frame, means supporting said bearing support comprising a helical spring and means supporting said helical spring in the base of said casing.

Coated Paper

Patent No. 2,128,296. Virginia Baker Goodwin and William H. Pashley, New York, N. Y. Application February 26, 1937. Serial No. 127,911. 6 Claims. (Cl. 91—68). As a new article of manufacture, a flameproof and water and moisture resistant paper, having its fibres impregnated with a flameproofing compound containing as an essential constituent ammonium sulphate, a network of glycerinated gelatine protecting said compound and retaining the same in the fibres and a waterproofing rubber coating on said paper.

Decalcomania Paper

Patent No. 2,128,588. John MacLaurin, Ware, Mass. Application December 11, 1935, Serial No. 53,956. 7 Claims. (Cl. 41—33). A decalcomania paper having as a backing layer a sheet of water leaf paper containing dye in sufficient quantity to impart a distinctive color to the paper, and a layer of adhesive coating thereon adapted to receive decalcomania printing, said colored backing layer being adapted to change color on the application of a suitable reagent.

Paper Making

Patent No. 2,132,016. Horace A. Du Bois, Neenah, Wis., assignor to Paper Patents Company, Neenah, Wis., a corporation of Wisconsin. Application April 20, 1936, Serial No. 75,262. 1 Claim. (Cl. 92—69). The process of manufacturing a very thin, fireproof, creped, cellulosic sheet suitable for use in making wadding on a paper making machine which includes sheet or web forming equipment and a single drying cylinder of relatively large diameter for drying the web, comprising the steps of forming a suitable cellulosic web through the use of the web forming equipment, transferring the formed web to the drying cylinder, charging or impregnating the web while it is on the drying cylinder and while it is still wet by applying directly to the outer face of the web most remote from the cylinder a solution of fireproofing salts, drying the impregnated web on the cylinder, and finally removing the dry web from the drying cylinder by a creping doctor.

Apparatus for Sizing Photographic Paper

Patent No. 2,129,249. John C. Trahey, Rochester, N. Y., assignor to Eastman Kodak Company, Rochester, N. Y., a corporation of New Jersey. Application March 27, 1937, Serial No. 133,423. 7 Claims. (Cl. 91—46). An apparatus for sizing paper comprising in combination, a tank adapted to contain sizing solution, a gas chest having a paper inlet above and a paper exit below the surface of the size, a gas inlet to the chest, a source of steam connected to the chest, a source of air connected to the chest, means included in the steam and air connections for initially mixing the gases before said gases are passed into the chest.

Safety Paper and Method of Making Safety Paper

Patent No. 2,129,362. Francis L. Simons, Needham, and Mark W. Weiss, Boston, Mass., assignors to George La Monte & Son, Nutley, N. J., a corporation of New Jersey. Application November 21, 1936, Serial No. 112,008. 20 Claims. (Cl. 283—8). A safety paper which comprises a surface layer and a sub-surface layer of a color which contrasts with the color of said surface layer, a first portion of said surface layer being adapted to become substantially more permeable to light when said portion in a dry state has a liquid applied thereto so that the color of said subsurface layer is visible therethrough, and a second portion of said surface layer which is contiguous with said first portion and is of substantially the same color as said first portion being adapted when said second portion in a dry state has said liquid applied thereto to have its permeability to light substantially less affected than said first portion.

Back Gauge for Paper Cutters

Patent No. 2,133,031. John R. Lahman, Dayton, Ohio, assignor to Harris-Seybold-Potter Company, Cleveland, Ohio, a corporation of Delaware. Application January 22, 1937, Serial No. 121,725. 5 Claims. (Cl. 164—59). In a paper cutting machine, a table, a back gauge movable thereof forwardly and backwardly, an electric motor arranged to drive said back gauge in either direction, front and rear limit switches for opening the circuit of said motor when the gauge reaches predetermined forward or rearward positions, a fixed bracket arranged intermediate the limits of travel of the back gauge, and lever means carried by the bracket adapted to be actuated by the gauge when it reaches its predetermined limits of movement, said lever means being adapted to operate said switches.

Machine for Refining Paper Stock

Patent No. 2,126,264. William V. Knoll, Dayton, Ohio, assignor to Mid-West-Fulton Machine Company, Dayton, Ohio. Application July 8, 1936, Serial No. 89,586. 3 Claims. (Cl. 92—24). In paper stock refining apparatus, the combination of a horizontal beater roll, a bedplate, a nozzle structure for directing separate streams of stock under high velocity tangentially against the blades at the edge of the bedplate, said nozzle structure comprising a large main nozzle portion the opening of which decreases in vertical dimension and increases in horizontal dimension as it approaches the roll, and a series of wedge shaped partitions in the large nozzle opening dividing said opening into a series of smaller nozzles tapering in both horizontal and vertical dimensions toward said roll.

Paper Machine

Patent No. 2,126,486. Bernard A. Malkin, Lachine, Quebec, Canada, assignor to Dominion Engineering Works Limited, Lachine, Quebec, Canada. Application September 30, 1936, Serial No. 103,375. In Canada June 6, 1936. 6 Claims. (Cl. 74—421). Spindle driving mechanism of the character described comprising a hollow frame structure, spindle bearings housed in said structure, spindles, journalled in said bearings and gears fixed to said spindles so that said gears are housed in the hollow frame structure between the bearings and the inner side of said structure, each of said gears comprising detachably connected sections including a hub section fixed to one of said spindles and a toothed ring section detachably carried by the hub section, said ring section being removable through an opening in the outer side of said hollow structure when detached from the hub section and being provided with a central opening large enough to permit it to be drawn outwardly over the adjacent bearing without disturbing the latter.

Method for Coating Paper

Patent No. 2,130,241. James D. MacLaurin, East Orange, N. J., assignor to Seaman Paper Company, Chicago, Ill., a corporation of Illinois. Application June 18, 1934, Serial No. 731,028. 1 Claim. (Cl. 91—68). A method of coating paper for printing purposes which comprises, distributing a predetermined quantity of coating material upon a continuously passing paper web in the form of a mobile film, and subjecting said film while the same is still in mobile condition to impact by a sheet or fluid directed under relatively high velocity at an angle to the surface of the web to smooth and compact said coating material upon said web while said web is traveling in a substantially horizontal plane, said method being characterized in that substantially all of the coating originally distributed upon the web is maintained thereon.

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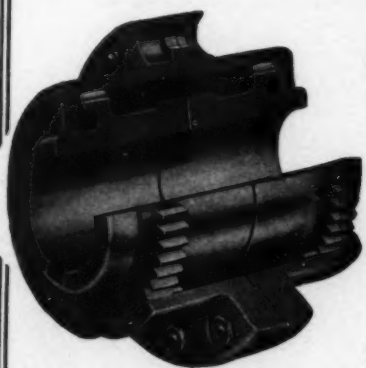

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Michigan Superintendents and Kalamazoo TAPPI Get Together

PRICES and wages were major topics of the evening in Kalamazoo January 5 when nearly 350 paper men convened for the fourth annual joint meeting of the Kalamazoo Valley section TAPPI and the Michigan Division of American Pulp and Paper Mill Superintendents Association.

The dinner and program maintained high key with an overflow crowd drawn from five states, with distinguished guests, and with provocative talks by informed paper executives.

D. Clark Everest, president of the American Pulp and Paper Association and president of Marathon Paper Mills, Rothschild, Wisconsin, told the throng that there is not "a single grade of paper which is not underpriced" today, and applauded a recent announcement of kraft paper price increases as a healthy sign.

Mr. Everest, who entered the paper business 39 years ago January 6 at Kalamazoo's Bryant Paper Company, made a strong plea for common sense labor relations and continued technical study.

Another speaker, Ralph A. Hayward, president of the Kalamazoo Vegetable Parchment Company, pointed to the "settled feeling" about wages which he saw in England as something to be desired in this country. Listing the virtues of wage stability, Mr. Hayward said:

"I'm sure manufacturers in this country don't care what the wage scale would be if they could have something to build on."

▶▶▶ William J. Lawrence, new president of Bryant Paper Company, was chairman of the program, which was turned over to him by Paul de Guerhery, Michigan Paper Company. Heading the committee which planned the event were Ray Barton, Michigan Paper Company; A. B. Perlick, of KVP; Lester La Liberte, of KVP; and Arnold Weller, Sutherland Paper Company.

Among those introduced by Toastmaster Lawrence were Roy Zellers and Robert Emminger, national officers of the superintendents, R. G. MacDonald, national secretary of TAPPI, and R. A. McInnis, president of the Canadian pulp and Paper Association.

Mr. Hayward, the first speaker, recounted sidelights of his recent European tour, commenting on the "cockeyed price structure" in the English paper market, which he ascribed to the import factor and "monopolistic practice."

Investigating paper economics there he found that the "highest paid hourly worker gets less than our minimum wage."

Because wages for all industries in relation to each other are arrived at annually in England by bartering for entire industries at once, he found a "settled feeling" which this country lacks to the detriment of management.

▶▶▶ Mr. Everest hailed the breakdown of the "secrecy, jealousy and suspicion" which existed prior to the superintendents association. "Things have changed since 1919. The farsighted men have changed with them. Today you exchange ideas freely and everyone benefits. . . . Operating staffs and technical staffs co-operate in giving the industry its best position. Never before have we made as good products or been in position to promptly produce products for the most exacting uses."

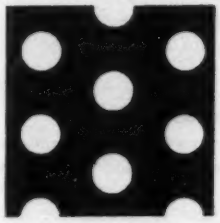
A new day in employee relations, which will include a "brass hat" personnel director, is here, Mr. Everest told the paper men.

"You might as well make up your mind that from now on you are but one cog in the wheel of collective bargaining, and that the bargaining agency will be that which is selected by majority vote of your employees," he said. Those who were early to recognize this "are at a decided advantage in employee relations" now, he continued.

The personnel director, while he may be "a bitter pill," will be "part of the changing order of things," the speaker predicted.

Referring to the "monkey business" of the past few years in labor relations, Mr. Everest ascribed it to the human tendency to show off by those with new authority. "Today there is a tendency toward sober thought in these matters," he said.

LEFT—Included at the speaker's table were these prominent paper men, (left to right) D. Clark Everest, president of Marathon Paper Mills; W. J. Lawrence, president of the Bryant Paper Company; R. A. McInnis, president of the Canadian Pulp and Paper Association, and Ralph A. Hayward, president of the Kalamazoo Vegetable Parchment Company. RIGHT—Four interested men at the banquet were, left to right, James Foxgrover, Hercules Powder Company, PMC Division; P. B. Stull of the same firm; O. W. Callighan, Edgar Brothers Company, and Charles Mueller, Hercules Powder Company, PMC Division.



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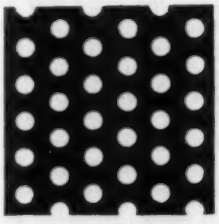

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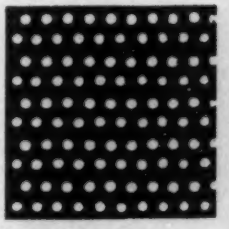

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In tribute to the technicians and their control methods, Mr. Everest said: "With few exceptions, paper made 10 years ago would not be acceptable in any market today." He urged that the association extend membership to converters' technicians, and suggested that more attention be given to a study of utilization and "new uses" research.

Barring a major European war, the speaker saw 1939 bringing a 15 to 20 per cent increase in volume. The pulp market is only now beginning to come back, he pointed out, after Japan and China, two major pulp buyers, started fighting in 1937.

MACHINERY ON PARADE AT 1938 POWER EXPOSITION

WITH three floors of New York's Grand Central Palace filled with an impressive array of power and mechanical engineering equipment which was inspected by nearly 42,000 visitors, the Thirteenth National Exposition of Power and Mechanical Engineering, held December 5-10, presented a most extensive and comprehensive picture of the operating facilities now offered to modern industry. More than 280 exhibitors showed their products to a substantially larger audience than attended the 1937 show.

The outstanding success of this year's presentation of power and mechanical engineering equipment was shared equally by the exhibitors, who had carefully prepared informative displays and by visiting manufacturers, engineers, factory superintendents and industrial specialists who took lively interest in the new products and methods on exhibition. Coincident with the power show was the annual meeting of the American Society of Mechanical Engineers which was in session at the Engineering Societies Building from December 5-9.

Included among the many exhibits at the power show were those devoted to stokers and boilers, turbines, generators, various types of controls, instruments, recorders, refractors, burners, valves and fittings, hose, tubing, piping, tools, belting, pumps, motors, materials handling equipment, and heating and ventilating equipment. There were also many exhibits devoted to factory maintenance specialties.

Instruments and Controls

Exhibits of instruments and controls, featuring new developments and unique applications, attracted wide attention. Working models of control panels demonstrated the latest methods of completely automatic control by means of electrically transmitted impulses. Magnetic liquid level gauges for atmospheric and pressure tanks up to 400 pounds pressure were shown. Of interest also was a high magnification recorder that uses radio tubes to record changes in length on a test bar and charts this relation with load. Another exhibit featured a complete line of manual, semi-automatic and automatic AC and DC motor starters, speed regulators and accessories.

Valves and Fittings

A wide variety of valves and fittings was introduced, including reducing, companion angle, gate, globe, water column and ringplate valves; pressure regulators, liquid level controls, duplex blowoff units, pipeline separators, boiler drum separators, throttles, swivel joints, expansion joints, draft gauge manifolds, condensation coils, bent tube assemblies, couplings, steam traps, pump governors and floats. A cross-sectionalized model demonstrated a valve that separates water and solids out of steam and compressed air as they flow through a self-contained separating unit inside the valve. This equipment is equally adaptable for recovering liquids and removing solids from gases. A new blow-off valve that combines a high pressure flanged union with a double valve in a single unit was shown, together with a complete line of precision-made devices for automatically controlling, on a predetermined basis, the operation of all types of electrically operated machinery. One exhibitor of steam traps demonstrated his products by means of a complete power plant assembly including boiler, reducing valve, load, trap, open receiver and pump.

Tubing and Piping

Developments that make possible quicker assemblies and improved operating efficiencies were shown by exhibitors of hose and tubing. One manufacturer of special welded pipe stressed the unusual coiling, bending and other forming operations of the product. Flexible metal hose and tubing exhibits featured the ability of all-metal pressure tubing to absorb vibration and movement while carrying liquids and gases under pressure. Various working demonstrations showed the correct way to install every kind of metal hose and tubing to obtain longest life at lowest cost.

Machines and Tools

A wide variety of machines and tools were on exhibition at the power show. One new development was a contour machine of unusual versatility and sturdiness, with a variable speed ranging from 50 to 1500 feet per minute. Among the many new electrical and pneumatic tools was a half-inch electric drill which is said to be just half the size and weight of previous machines but which has exactly the same power. A quick-heating, portable gas-electric blow torch was also shown. Demonstrations of improved welding equipment drew the attention of many visitors. Many different kinds of manual and automatic saws and accessory equipment were displayed, including a hard-tooth, flexible-back high speed hack saw blade claimed to be unbreakable in use. A complete line of band saws was also exhibited.

Belts

Belt and transmission equipment shown included industrial and light-duty V-belts, frictionized belting, belt fasteners, round and flat endless belts, silent and roller chain drives, flexible couplings, variable speed units, speed controls, stand and over-running clutches, stock gears and sprockets. A special process belting that is said to eliminate the breaking-in period was also shown.

Materials Handling

Materials handling equipment included lift trucks, portable elevators, motor truck cranes and winches, skid and drum racks, barrel trucks, safety pull ratchet lever hoists, low head hoists, eccentric gear chain hoists and electric industrial trucks. One of the most spectacular installations at the power show was a unique rubber conveyor belt system that rose from the floor to the ceiling in the open court of Grand Central Palace. Another exhibit that attracted wide attention featured overhead monorail trucks typically mounted and in full operation.

Heating and Ventilating

Heating and ventilating equipment was well represented by industrial ventilating fans, attic fans, unit heaters and portable conditioners, many of which were demonstrated in operation.

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Felt making requires modern facilities and skilled workmanship. If you would like to see the way it is done . . . the way Orr does it . . . pay us a visit. We'll be glad to take you through our plant, which is the most complete, the most modern, and the largest paper mill felting plant in the world.

Therein lies the explanation of Orr Felt success on paper machines of every type, making every grade known, both here and abroad.

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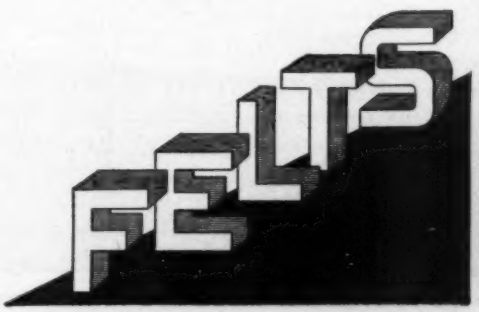

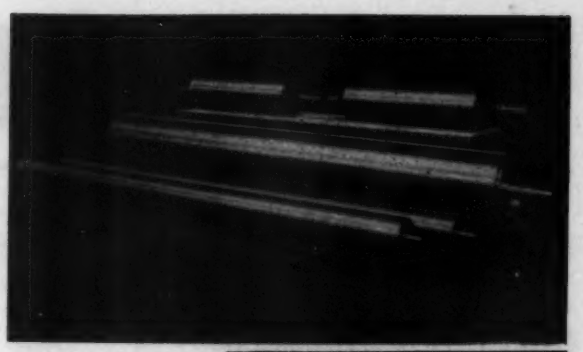

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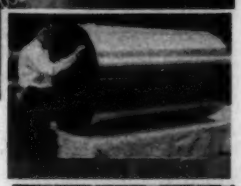

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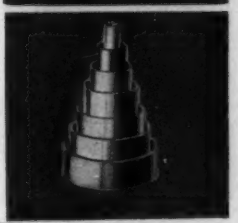

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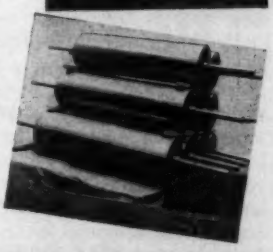

Sandusky Cast is PRESSURE CAST

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OTHER COUNTRIES

ITALIAN NEWS

Papyrus Exploitation

An important cultivation of papyrus, estimated to result in 750 tons of the dry product, has been started at Tana Lake, Italian East Africa. Italy has also initiated the growing of papyrus on the Isle of Abba Morima and along the Blue Nile in East Africa.

Italian Mills

There are many new expansion programs now under way at some of the Italian paper and pulp mills. Included among these are the Societa per la Fabbricazione della Pasta di Legno, of Carmignano Brenta (Padua) which is installing new equipment for the production of cellulose; S. A. Meridionale Industria Cartonaggi ed Affini, Naples, which is installing machinery for the production of ondulated paper and paperboard and the S. A. Cartiere Burgo, Turin, which is enlarging its works of Romagno Sesia. In addition it is learned that Societa in Accomandita L. De Medici e C. of Cirie (Turin) is installing new equipment for the production of cellulose.

New Cellulose Plant

A new plant for the production of sulphite cellulose from chestnut and other woods, is now being erected by the Italian firm, "Societa Anonima Cellulosa d'Italia," in the locality of Madonna dell'Olmo. The new mill will also utilize poplar trees in the production of cellulose.

◆

AUSTRALIA HAS NEW BOARD MILL

A new plant for the production of ½-inch insulating board from sugar cane fiber is now under construction at Pyrmont, Sydney, Australia, by the Colonial Sugar Refining Company, Ltd. The initial capacity of the plant will be approximately thirty million square feet annually.

The plant building will have a floor area of 108,200 square feet and will be the largest and most modern in the Southern hemisphere for the product, it is reported. The structure will be of reinforced concrete throughout and will include a main two-story building designed for straight-line production. In addition there will be a multi-story wing in which the preparatory manufacturing processes will be carried out.

The entire factory will be faced with red brick, and the architectural treatment will emphasize the length of the building by the continuous lines of horizontally-proportioned windows, broken only by the structural concrete columns. In contrast, the administrative offices will be vertical in effect.

◆

ENGLISH NOTES

British Wood Pulp Association

The annual meeting of the British Wood Pulp Association revealed the difficult situation that the pulp people have had to face during 1939. It is admitted that prices moved too high during 1937 but now it is seen that prices have declined to 1935 levels when it was recognized that these were uneconomic. There is, however, a note of optimism expressed, backed by slight signs of improvement in the United States. The Paper Makers Association recently approached the Wood Pulp Association with a request that some means should be discovered to avoid such wide fluctuations in prices in the future.

Colored Paper

Hitherto the coloring of paper has been effected in the beater but recently British paper men saw samples of papers which had been colored after manufacture. The coloring matter went right through the sheet and it was impossible to appreciate that this was an after process or had been effected by any method save the usual way except that the colors were extremely vivid and beautifully uniform. The two chief virtues of this operation appear to be (1) a wider range of shades and (2) the coloring matter is kept away from the machine and is therefore a cleaner process. It is believed that there is a great future for this form of paper coloring and that the older method may be gradually superseded.

Imports and Exports

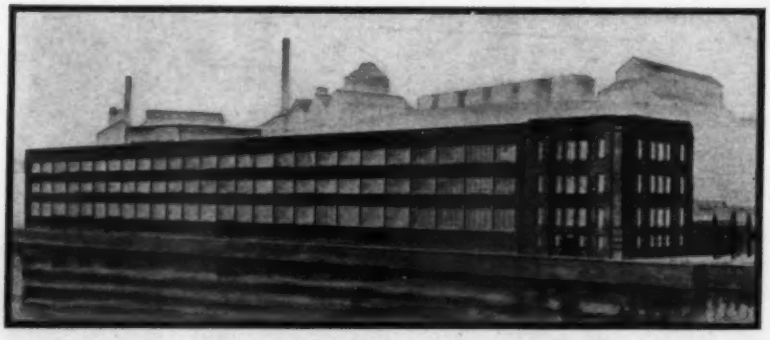
Comfirmation of the generally quiet situation of the British paper trade during 1938 is disclosed by recent Board of Trade returns. It is noted that the total exports for ten months had reached only 143,350 tons, compared with 181,878 for the same period in 1937. Imports of manufactured paper total 878,391 tons compared with 1,048,393 for January-October 1937. Imports of papermaking materials have declined from 1,783,899 to 1,604,101 tons.

◆

MAKE HAND-MADE PAPER IN INDIA

A standardized scheme for the production of hand-made paper has been formulated by the Department of Industries, Bengal, India. It has been found possible to utilize raw materials such as jute stalk, paddy straw, leaves of certain plants, etc., for the production of pulp in place of the expensive chemicals and sizing and finishing materials which have hitherto been considered indispensable for papermaking.

The Department of Industries proposes to pursue experiments and research in this direction with a view to developing the scheme as a large-scale industry. It is said that the new method reduces the cost of production about 50 per cent.



Colonial Sugar Refining Company's new board mill in Sydney, Australia.

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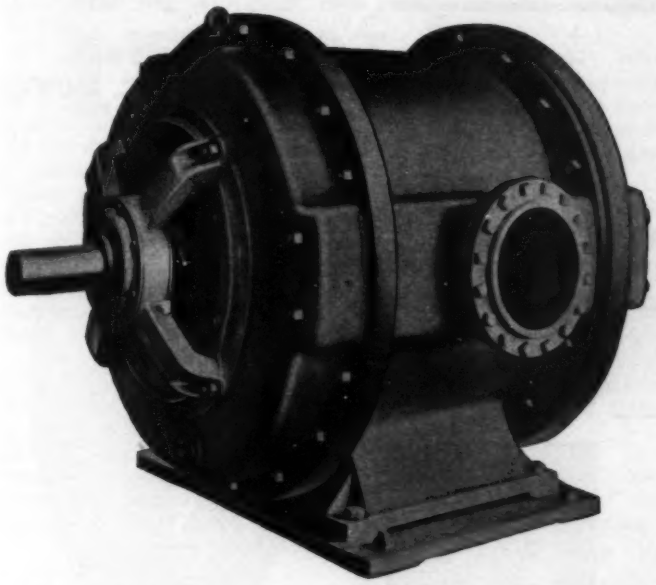

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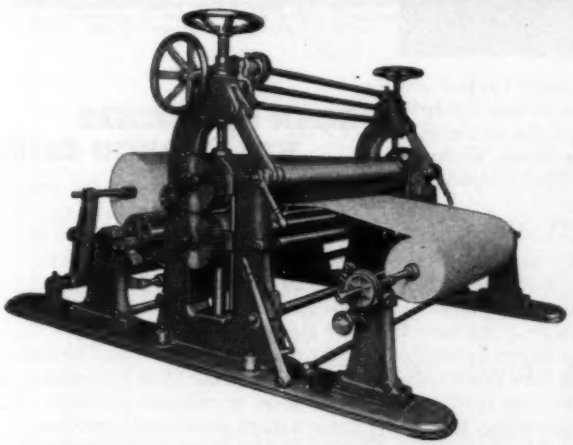
THE NASH ENGINEERING COMPANY

SOUTH NORWALK, CONNECTICUT, U. S. A.



STANDARD EMBOSSER

For tissues, cardboards, covers, offset papers, liner boards and other materials taken off jumbo rolls and delivered to rewinder.

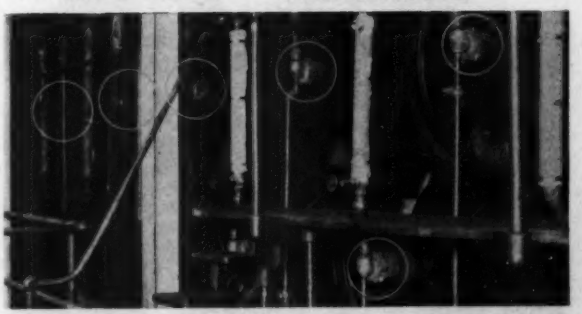
Unit illustrated has single drum winder but same unit may be furnished with double drum or friction shaft winder.

Hudson Sharp embossers may be obtained in varied designs for any purpose. Hudson Sharp steel embossing rolls and paper rolls are especially designed for any embossing purpose.

Hudson Sharp Machine Company

Green Bay, Wisconsin

It's time to replace the old "steamfits"



— with **JOHNSON** ROTARY PRESSURE **JOINTS**

forget:

1. **Packing.** The special carbon graphite seal-ring totally eliminates packing.
2. **Oiling.** The seal-ring and bearing ring are entirely self-lubricating.
3. **Adjusting.** The joint is pressure-sealed—the higher the pressure the tighter the seal.

The design of Johnson Joints also compensates for both lateral and angular misalignment. There is a joint for every make of paper machine with any type of drainage. They are saving time, steam, power and speeding up production in scores of mills.

Ask for latest bulletins.

The Johnson Corporation

845 WOOD STREET — THREE RIVERS, MICH.

PERSONALS

HEYWARD HEADS NEW SOUTHERN FORESTRY GROUP

Frank D. Heyward, Jr., formerly Forester for the State of Georgia, will take over the position of Administrator of the Southern Forest Conservation Program, on February 1, 1939. The program is sponsored by the American Pulpwood Association and has been adopted by the integrated pulpwood, pulp and paper industries of the South.

Mr. Heyward, who has been acting field director for the Herty Foundation Laboratory, is extremely well qualified by his ability and knowledge of conditions in the Southern pine forests to direct the activities of the conservation program. It is believed that the new work will present a broader opportunity for public service to the entire South. The head office will be located in Atlanta, Georgia.

◆

▶▶▶ Newly appointed superintendent at The Coshocton Straw Paper Company, Coshocton, Ohio, is *H. G. Funsett,* formerly superintendent at mills of the Hagar Straw Board & Paper Company, Cedarville, Ohio, and Ball Brothers Company, Noblesville, Indiana. Mr. Funsett succeeds Clay V. Watson who was superintendent at the Coshocton mill for twenty-one years prior to his death in December.

◆

D. E. JONES VISITS EUROPEAN MILLS

Bringing back many enthusiastic reports of progress made in the application of new types of equipment abroad, Dwight E. Jones, acting chief engineer of the E. D. Jones Company, Pittsfield, Mass., has resumed his regular duties.

Mr. Jones spent considerable time with Bertrams, Ltd., of Edinburgh, originators of the Bertrams Patented Beater which the E. D. Jones Company is building in this country under the name of the Jones-Bertram beater. He also visited several other builders of paper mill equipment and numerous paper mills both in England, on the Continent, and in Scandinavia.

Of outstanding interest was Mr. Jones' visit to the only company which quarries Basalt Lava suitable for the paper industry. Mr. Jones witnessed the fabrication process of this difficult material which has a widespread application throughout the United States for preparing stock in mills.

◆

S. J. MARTIN HAS NEW POSITION AT PIPING COMPANY

Associated in many capacities with the piping industry in the design, fabrication, and erection of power and process piping, S. J. Martin has been appointed manager of the Engineering Department of the Pittsburgh Piping and Equipment Company, Pittsburgh, Pa. Mr. Martin is also familiar with high pressure valves and specialties. A graduate of the Carnegie Institute of Technology, Mr. Martin was formerly superintendent of erection of the piping installation at the Irving Works of the Carnegie Illinois Steel Corporation.

◆

▶▶▶ *C. A. Kramer,* assistant treasurer of the Fort Wayne Corrugated Paper Company, Fort Wayne, Indiana, resigned effective January 1 because of failing health. He will be succeeded by *J. N. Johnston,* of New York. Mr. Johnston was formerly associated with the management engineering firm of Stevenson, Jordan & Harrison, New York.

◆

▶▶▶ *L. J. Belnap,* president of the Consolidated Paper Corporation, Ltd., was recently elected a director of Dominion Glass Company, Ltd.

◆

▶▶▶ *Ernest G. Rolph,* sales manager of the Alliance Paper Mills, Ltd., Toronto, has resigned to assume his new duties as vice-president and manager of Canada Glazed Paper, Ltd., which firm is establishing a factory in Toronto for the manufacture of coated papers. Mr. Rolph, who is well known in the industry, was for some years on the advertising staff of the Howard Smith Paper Mills.

◆

WEED NOW PRES. OF F. C. HUYCK

Succeeding the late Frank C. Huyck as president of F. C. Huyck and Sons is Woolsey W. Weed, formerly of Albany and for many years head of Kenwood Mills, Ltd., Arnprior, Canada. Mr. Weed has been at the company's Canadian branch since 1919 and, although he plans to return to Albany, he will continue to have charge of Kenwood Mills, Ltd., a wholly-owned subsidiary.

Other new officers elected at the recent reorganization meeting were: James L. Braman, vice-president and treasurer; Francis Huyck Eldridge, vice-president and general manager; Harry Eldridge, secretary and assistant treasurer, and Charles V. Spencer, comptroller.

◆

▶▶▶ Two foremen of the Nekoosa plant of the Nekoosa-Edwards Paper Company, *Louis Koehn* of the hydro plant and *Renner Vehrs* of the service crew, have returned from a 3,500-mile trip to Louisiana and Florida. They visited several Southern paper mills en route.

◆

EGAN ADDRESSES KALAMAZOO CLUB

An interesting talk on the subject of "Applying the Dow Theory" was presented by Roger Egan of the Bulkley, Dunton Pulp Company, Inc., before the Purchasing Agents Club of Kalamazoo, Michigan, at their December meeting.

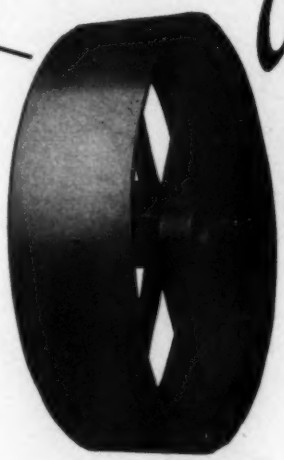
At the meeting Mr. Egan interpreted and explained the Dow Theory and its application to business problems. Extensive chart studies and statistical data were discussed and each member was presented with a copy of Robert Rhea's newly-published book, *Dow's Theory Applied to Business and Banking.* This was the second time Mr. Egan had appeared before the Kalamazoo organization.

◆

▶▶▶ *H. Follette Hodgkins,* president of the Rollway Bearing Company, Inc., has taken over the general managership of the company in lieu of W. H. Float who recently resigned. No immediate successor to Mr. Float will be appointed, Mr. Hodgkins announced.

CAST IRON Pulleys

TIGHTWADS OF THE PULLEY FAMILY



The undeniable superiority of the cast iron pulley is reflected in dollars-and-cents saving to every user of WOOD'S Pulleys. True running, rigid, strong and more durable . . . you can install no finer pulleys, none more accurately balanced and downright power stingy on your drives. Details and prices—yours without obligation. Just write us on your letterhead.

T. B. WOOD'S SONS CO.

50 Church St. New York City

CHAMBERSBURG, PA.

Member: Power Transmission Council

387-391 Atlantic Ave. Boston

O LORD . . .

Help me to win, but if I can not win, teach me to be a good loser. Teach me, too, neither to cry for the moon nor over spilt milk . . .

KALAMAZOO VEGETABLE PARCHMENT CO.

PARCHMENT • KALAMAZOO • MICHIGAN

C. QUINCY IVES NOW CONDUCTING OWN LABORATORY

For the past six years Director of Research for the Sherman Paper Products Corporation, Newton Upper Falls, Mass., C. Quincy Ives is now conducting his own research laboratory at Reading, Mass., where he is serving a

C. Quincy Ives

selected list of clients in the development of new and improved products in the paper field. Mr. Ives, who is the inventor of the well-known Corroflex flexible cushion wrapper, was for many years with the Brown Company of Berlin, New Hampshire, where he assisted in the development of fiber conduit, paper towels, yarn and other materials made from cellulose.

Mr. Ives has also invented an apparatus for raising liquids, means for testing the dryness of fibrous materials, a new method and manufacture of corrugated papers, a new method of making bends in fiber tubes.

◆

▸▸▸ The Don Valley Paper Company, Ltd., Toronto, has announced the appointment of *Maurice O. Neilson,* well known chemical engineer, as superintendent and mill manager of the company's mill at Todmorden. Mr. Neilson was formerly with Belgo-Canadian and J. R. Booth, Ltd.

◆

▸▸▸ *Clifford Chase,* assistant master mechanic and safety director at the St. Croix Paper Company, Woodland, Maine, recently won a seat in the Maine Senate and it is expected that he will be assigned to major committees this winter. Previously, Mr. Chase was a member of the House of Representatives.

▸▸▸ Formerly assistant superintendent of the American Writing Paper Corporation, Holyoke, Massachusetts, *Leonard S. Taylor* has resigned to become superintendent of the Byron Weston Paper Mill of Dalton, Mass. While with AWP Mr. Taylor was associated with the Riverside and Gill divisions. He has been associated with the paper industry since a young man.

◆

WALTER B. STRONG IN NEW POSITION AT WORTHINGTON

Now assistant sales manager of the Worthington Pump and Machinery Corporation, Harrison, N. J., is Walter B. Strong, formerly manager of the firm's export division. In his new assignment, Mr. Strong will continue general supervision of export sales and will also be identified with certain phases of domestic sales work. He is a graduate of the Massachusetts Institute of Technology and has been a member of the Worthington organization since 1920. George Gellhorn, Jr., will succeed Mr. Strong as manager of the export division.

◆

▸▸▸ New general manager of Robert Gair Company, Inc., is *Norman F. Greenway,* formerly resident manager

N. F. Greenway

of the company's Piermont Division, the largest manufacturing unit of the New York box firm.

◆

▸▸▸ *L. J. Parant,* vice-president and general manager of the St. Croix Paper Company, Woodland, Maine, has returned to his duties, having recovered from a recent illness.

W. J. BRENNAN WITH NEW MAINE ORGANIZATION

The many friends of Walter J. Brennan, formerly Highway Safety Director for the State of Maine, will be interested to know that Mr. Brennan is now engaged in building up a new organization called Associated Indus-

Walter J. Brennan

tries of Maine. Prior to his connection with the State Government, Mr. Brennan was safety director of the St. Croix Paper Company, Woodland, Maine, and was an active member of the Paper and Pulp Section of the National Safety Council. He served as general chairman of that section for a year beginning October, 1930.

The Associated Industries of Maine is a service organization to manufacturers charged with looking after the interests of industrialists of the State, whether it be in matters of legislation or freight rates. The association is affiliated with the National Association of Manufacturers, the National Industrial Council, the New England Council, and similar State organizations elsewhere.

The paper industry is substantially interested in this new organization. On the board of directors are such well-known men as Joseph A. Watter and John E. Hyde, of the S. D. Warren Company; Rex W. Hovey, Chester W. Alden and T. F. Spear of the Oxford Paper Company; Arthur L. Hobson, of the St. Croix Paper Company; and John Rogers and Robert T. Davis, of the Rogers Fibre Company. Joseph A. Warren is treasurer of the organization and T. F. Spear, general manager of the Oxford Paper Company, Rumford, Maine, is vice-president. Mr. Brennan's official capacity is executive secretary.

SAVE
Time and Labor
SAFEGUARD
Valuable Rolls of Paper

With Stanley Strapping Equipment one man is able to tighten, cut and seal strong steel bands around a roll of paper. And, do it so easily and quickly that no other *secure* method can approach this for economy.

Stanley Strapping also saves money by safeguarding valuable rolls of paper in stock and in transit. The flat bands and seals cannot injure the paper.

Stanley offers both Flat and "Laytite" (Concave) Strapping. Also a complete range of strapping tools. A Stanley engineer will be glad to advise you about the best equipment to handle your shipping units. It will pay you to investigate. Write to Steel Strapping Division, The Stanley Works, 142 Lake St., New Britain, Conn.

STANLEY
TRADE MARK

Stanley "H" Tightener

Stanley "R" Tightener with Roll Attachment

Stanley "L" Sealer

The STANLEY STRAPPING SYSTEM

NEW ECONOMIES in DRYER FELTS obtained with WOODBERRY 887

REINFORCING GREATLY PROLONGS THEIR LIFE

✻ WOODBERRY 887 MAGNIFIED 2½ TIMES

New economies are being effected by leading paper mills everywhere throughout the country with WOODBERRY 887 dryer felts. These new patented felts are reinforced at intervals on the face with asbestos yarns which give them considerably longer life and reduce operating costs.

All the virtues of fine, all cotton felts, are retained in WOODBERRY 887's. They are fast drying, requiring a minimum of steam consumption. Shrinkage and stretch has been reduced to a minimum.

Like all Mt. Vernon-Woodberry Mills products, they are woven to rigid standards of tolerance and are really precision fabrics. Specify WOODBERRY 887 Dryer Felts and discover the savings they will effect for you.

MT. VERNON-WOODBERRY MILLS, INC.
TURNER HALSEY COMPANY
40 WORTH STREET *Selling Agents* NEW YORK CITY
Branch Offices: SAN FRANCISCO · NEW ORLEANS · CHICAGO · BOSTON · BALTIMORE

POTPOURRI

EXPOSITION NEWS

NEW YORK

▶▶▶ WITH GROVER WHALEN, president of the New York World's Fair, and guests and members of the Johns-Manville Corporation in attendance, the J-M exhibit building was formally dedicated recently by Lewis H. Brown, president of the organization. The building, the first private exhibit structure completed at the Fair, has for its main theme the gigantic figure of an asbestor-clad man. In dedicating the building, Mr. Brown pointed out the company's activities include services for practically every major industry in the United States. He declared that through the exhibit building, Johns-Manville will interpret these services to the American people.

▶▶▶ AN ANALYSIS OF THREE SURVEYS of probable attendance at the New York Fair indicates that official estimates of 60,000,000 have been, if anything, rather conservative, according to Grover A. Whalen. The three surveys were made on the basis of populations sampling by organizations independant of the Fair Corporation and of each other. These organizations were *Fortune Magazine, The New Yorker* and the Ross Federal Research Corporation.

SAN FRANCISCO

▶▶▶ THE WESTERN CHEMICAL CONGRESS—a meeting of all chemical societies and associations—will be held during the Golden Gate International Exposition on the already famous Treasure Island. August 7-11 has been set as the tentative date, according to Dr. Rene Engel, secretary of arrangements. The object of the congress will be to explain the place of chemistry in modern life and to study possibilities of improving and expanding Western chemical process industries. Discussions of natural resources, materials and opportunities afforded in the West, together with the study of means of widening Western markets and stimulating general consumption abroad will be taken up.

▶▶▶ THE GENERAL ELECTRIC COMPANY will demonstrate amazing scientific phenomena at the House of Magic on Treasure Island during the 1939 San Francisco Fair. A modern version of the fabulous magic carpet, which will float in air without any visible means of suspension, will be one of the G-E company's demonstrations. A radio fever machine, producing artificial fever, will also be exhibited.

◆

SELECT JURY FOR PACKAGING AWARD

The American Management Association, sponsoring organization of the annual competition for the Irwin D. Wolf Awards for outstanding accomplishment in packaging, has announced details of the eighth competition together with the personnel of the Jury of Award. The Association also announced this year the affiliated sponsorship for the awards of two organizations, the Advertising Federation of America and the Consumer-Retailer Relations Council.

All packages entered in the competition will be exhibited as a featured section of the Ninth Packaging Exposition which will take place March 7-10 at the Astor Hotel, New York City. Last year's winner of the Irwin D. Wolf trophy was The Hoover Company whose Ensemble Cleaner carton and tool kit took the top prize.

The personnel of the Jury of Award, which will pass on the merits of all packages entered, includes James C. Boudreau, director, School of Fine and Applied Arts; W. F. Deveneau, sales promotion manager, National Folding Box Company; Joseph M. Givner, assistant to the vice-president in charge of merchandising, Sears, Roebuck and Company; Edgar Kobak, vice-president, Lord & Thomas; C. B. Larrabee, editor, Printers' Ink Publications; Mrs. Carol Willis Moffett, New York; and Miss Dorothy Shaver, vice-president, Lord & Taylor.

◆

NIAA PERSONNEL SERVICE OFFERED

The National Industrial Advertisers Association, 100 East Ohio Street, Chicago, has decided to continue as a permanent activity the free employment service it inaugurated on an experimental basis last year. Companies seeking men for positions requiring knowledge and experience in the fields of industrial advertising, marketing, sales promotion, research or publishing, are invited to take advantage of this service. Such inquiries, directed to the headquarters office of the association, will be forwarded to the chapter of the association in the area from which the inquiry originates. The association now has seventeen such chapters located in the principal industrial areas, with a total membership of over 1,200. The headquarters office maintains duplicates of all applications for positions received from its chapters, and in cases of inquiries from non-chapter areas, will supply the inquirer direct with names and information concerning applicants who appear to have the necessary qualifications.

Those interested in the NIAA's service may direct their requests for information to the association's headquarters office, or to an officer of the nearest chapter.

◆

NEWSPRINT FROM STRAW WILL BE PUT TO A TEST

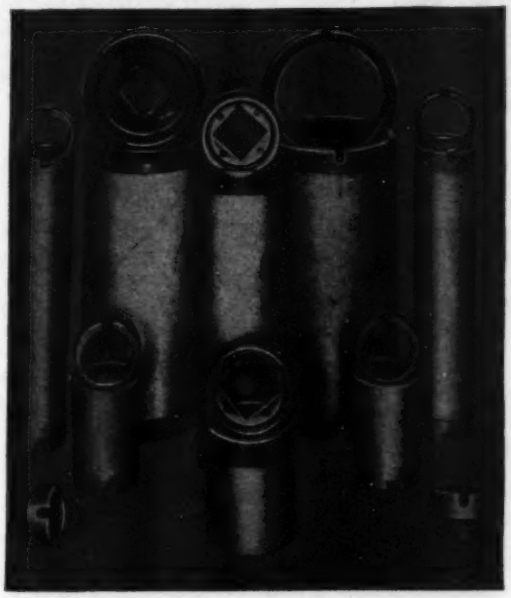
A practical test of the manufacture of newsprint from straw (cf. *Paper World,* p. 14, Feb., 1938) is announced by Dr. F. W. Hochstetter of Pittsburgh. Sufficient pulp will be made from Pennsylvania wheat straw to produce ten tons of newsprint which will be tested on three Pittsburgh newspapers for its commercial possibilities. The paper made from this pulp, according to Dr. Hochstetter, will be produced at the Tarentum Paper Mills at Tarentum, Pennsylvania. He estimates that the cost of this product will be about $36 per ton. The doctor further stated that paper can be made by his process from Florida grasses, seaweed, and cotton plant stems.

◆

TECHNICAL MEN OFFERED SPECIAL WRITING COURSE

The Extension Division of the University of Wisconsin, Madison, now offers a home-study course on the Composition of Technical Papers. This course has been arranged to meet the need of persons in specialized fields for greater proficiency in writing articles for publication, as well as business letters and reports. The student is given assignments introducing him to professional style in the arranging of technical papers. Instruction is personal through the exchange of helpful comment, criticism and suggestions.

This course offers the student practical application in his own line of work which moulds his training to the needs of his occupation.



ELIXMAN

CAPS

Straight wound paper cores made in sizes from 2" to 10" inside diameter with any thickness wall required.

Long draw protected slot caps of heavy gauge steel in all standard sizes.

Heavy duty caps with re-enforced square hole. This patented feature of re-enforcement gives added strength and durability.

CORES

Samples of caps or cores will be gladly submitted.

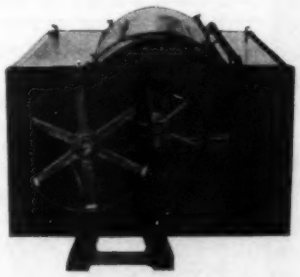
ELIXMAN PAPER CORE COMPANY, Inc.
CORINTH, N. Y.

The A. D. Wood Machine

PULP THICKENER — WASHER — SAVEALL
and WATER SCREEN

No Couch Roll or Doctor. Handles variable flows and consistencies. Equipped with patented Double Sealing Collars. Rubber covered or stainless steel construction. Efficient, economical and practically automatic.

Over 30 installed in 1937.



GLENS FALLS MACHINE WORKS, Inc.
GLENS FALLS, N. Y.

Ask for descriptive Bulletin

HARDY S. FERGUSON & COMPANY

CONSULTING ENGINEERS

200 FIFTH AVENUE **NEW YORK CITY**

Hardy S. Ferguson—*Member A.S.C.E. A.S.M.E. E.I.C.*
Moses H. Teaze—*Member A.S.C.E. A.S.M.E. E.I.C.*

Consultation, reports, valuations, and complete designs and engineering supervision for the construction and equipment of

- PULP AND PAPER MILLS AND OTHER INDUSTRIAL PLANTS
- STEAM AND HYDRO-ELECTRIC POWER PLANTS
- DAMS AND OTHER HYDRAULIC STRUCTURES

High Density BEATERS

Hundreds of highly successful installations in service.

THE MIDWEST-FULTON MACHINE COMPANY
DAYTON, OHIO, U. S. A.

NECROLOGY

WM. J. CHALMERS

Co-founder of what is now the Allis-Chalmers Manufacturing Company of Milwaukee, Wisconsin, William J. Chalmers passed away December 10 at the age of 86. Mr. Chalmers and his father, Thomas Chalmers, founded the Fraser & Chalmers Company in 1872. This firm was, for the most part, engaged in the manufacture of mining machinery. In 1901 it was combined with the Gates Iron Works Company of Chicago, the Dickson Iron Works Company of Scranton, Pa., and the E. P. Allis Company of Milwaukee to form the present Allis-Chalmers Manufacturing Company.

Mr. Chalmers was chairman of the executive committee of the Allis-Chalmers organization from 1901 to 1904. He retired from the company in 1906.

◆

▶▶▶ *Karl Mathie,* one of the organizers of the Marathon Paper Mills Company, Rothschild, Wisconsin, and the Mosinee Paper Mills Company, Mosinee, Wisconsin, passed away December 9 at the age of 72 in Los Angeles. Mr. Mathie was recognized as a leading industrialist of the Wisconsin River Valley and had been on the board of directors of both of the companies he helped organize. He was a graduate of Lawrence College, Appleton, Wisconsin.

◆

▶▶▶ *Frank McEwan,* co-founder of the Newark Boxboard Company, Newark, New Jersey, was fatally injured in an automobile accident on December 19. The accident took place at Livingston, New Jersey, when Mr. McEwan's car struck an obstruction and was overturned. Mr. McEwan is survived by his widow and one daughter.

◆

JAMES W. DUVALL

Formerly superintendent of the Crown Willamette Paper Company's bag factory at Camas, Washington, and founder and former owner of the Perfection Twine Company, of Camas, James Wilson Duvall passed away November 1 at the age of 68.

Mr. Duvall came to Camas in 1909 to take the superintendency of the bag factory, a position he held until 1927. In 1929 he founded the Perfection Twine Company, which firm manufactured paper twine and specialty products. He was formerly president of the National Association of Paper Twine Manufacturers and as an inventor of converting machinery made many valuable contributions to the industry. Mr. Duvall is survived by his widow, a son and a stepson.

◆

PERCY C. DAY

Percy C. Day, vice-president and chief engineer of the Falk Corporation, Milwaukee, Wisconsin, and a prominent engineer in the development of gearing, marine and rolling mill equipment, passed away December 7 at his home in Elm Grove, Wisconsin. He was 63 years of age.

In charge of the West Drayton Gear Works in England, Mr. Day came to the United States in 1910 and became associated immediately with the Falk Corporation. He came to the latter firm as chief engineer to direct the work of pioneering in helical and herringbone gearing in the United States.

Percy C. Day

Previous to this time Mr. Day had performed pioneering work in the electric-metallurgical field, principally in developing electric furnaces and calcium carbide. He designed, built and operated the first commercial plant producing this latter chemical in the British Isles.

Recognized throughout the world as a leading authority on design of helical gears, Mr. Day was an inventor of a number of patents relating to gear type equipment in addition to gear transmission and large drives for roller mills. He was a member of the American Gear Manufacturers Association, the American Society of Naval Engineers and the American Society of Naval Architects. He was named vice-president of the Falk Corporation in 1937.

◆

▶▶▶ Formerly president of the Castanea Paper Company, Johnsonburg, Pennsylvania, *A. Gibson Paine, Jr.,* passed away December 1 after a prolonged illness. He was 48 years of age and is survived by a son and two daughters. In addition to his presidency of Castanea, Mr. Paine was also formerly vice-president and a director of the New York & Pennsylvania Paper Company.

◆

R. B. TEWKSBURY

One of the founders of the Oster Manufacturing Company and chairman of the board of the Cleveland firm, Russell B. Tewksbury passed away January 1 at his winter home in Sarasota, Florida. Mr. Tewksbury was 79 years of age.

Mr. Tewksbury aided in the founding of the Oster organization in 1893 and assumed the presidency of the pipe and bolt threading equipment firm in 1898. He held that position until five years ago when his son, Roger G., succeeded him. Mr. Tewksbury was also director of the Cleveland Tractor Company and the Electric Railway Improvement Company of Cleveland.

Surviving Mr. Tewksbury, in addition to his widow, are two sons, a daughter, and eight grand-children.

◆

▶▶▶ *C. Harry Carruthers,* mill superintendent for the Powell River Company, Powell River, B. C., passed away recently at the age of 52. Mr. Carruthers was a native of England but had lived in Canada 36 years, twenty-seven of which were spent at Powell River.

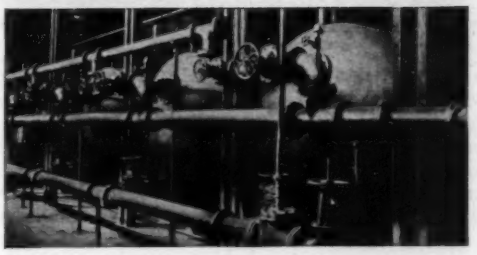
◆

▶▶▶ Formerly president of the Don Valley Paper Company, Toronto, *James G. Worts* passed away December 7 following a brief illness. He was 56 years of age and had retired some time ago. A widow and three sons survive him.

◆

▶▶▶ Assistant purchasing agent of St. Lawrence Paper Mills, Ltd., Three Rivers, Quebec, *Percy P. Ford* passed away recently at the age of 39. He had

HOW YOU CAN MAKE CLEANER PAPER



YOU can make cleaner, better paper . . . free from specks and spots . . . if you use cleaner water. You can have cleaner water if you have good water filters . . . modern, efficient, in good working order and of adequate capacity.

Hundreds of leading paper mills have satisfied themselves that the easiest, most economical way to have good filters . . . filters that can be continuously depended on to deliver a high quality clean water . . . is to work with Norwood's engineers.

If you want cleaner paper, or if your filters need to be modernized, discuss your water problems with Norwood's engineers.

THE NORWOOD ENGINEERING CO.
16 No. Maple St., Florence, Mass.

Pressure and Gravity Filters

A GOOD START AND A GOOD FINISH WITH
NORWOOD
DEPENDABLE WATER FILTERS AND PAPER FINISHING MACHINERY

Super and Glassine Calenders

For Sale—Paper Machinery

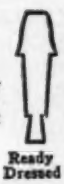
Paper Machines: 72 in., 126 in.
Experimental Fourdrinier Paper Machine with wire 46 in. by 50 ft., 2 presses, Minton vacuum dryer, worn gear drive.
Calender Stacks: 116 in., 114 in., 104 in., 100 in., 90 in., 88 in., 84 in., 76 in.
Super Calenders: 44 in., 72 in., motor driven.
Sheet Cutters: 72 in., 94 in., 108 in., 136 in., duplex with or without layboys: single: 44 in. to 100 in. (20 cutters and layboys).
Slitters: 60 in. Cameron. 60 in. Kidder.
Trimmers: 2-50 in. Seybold.
Dryers: Several hundred, from 42 in. to 100 in. face.
Fourdrinier Part: Late type, Moore & White, takes wire 80 in. by 50 ft., with Voith inlet and suction couch.
Jordans: 3 Jones, 2 Emersons, 2 Appleton.

BEATERS—PUMPS—ROLLS—REEVES DRIVES
Write to us when you want to sell Paper Mill Machinery

FRANK H. DAVIS CO.
175 Richdale Avenue, Cambridge, Massachusetts

"READY DRESSED" MILL COGS
LABOR SAVING—TIME SAVING

THE MOST ECONOMICAL FILLING THAT CAN BE PUT IN A MORTISE WHEEL


Ready Dressed

Blank Head

WE MAKE ANY STYLE OR SIZE WANTED

WRITE FOR INSTRUCTION SHEET "B" WHICH IS FREE

QUICK SERVICE ON ALL SIZES
THE N. P. BOWSHER CO., South Bend, Ind.

RECORD 2-WAY (2 PORTS) AND 3-WAY (3 PORTS)
"CLEAR-WAY" BALANCED GATE THICK STOCK VALVES
"IMPROVED TYPES"

FOR PAPER AND PULP MILL SERVICE

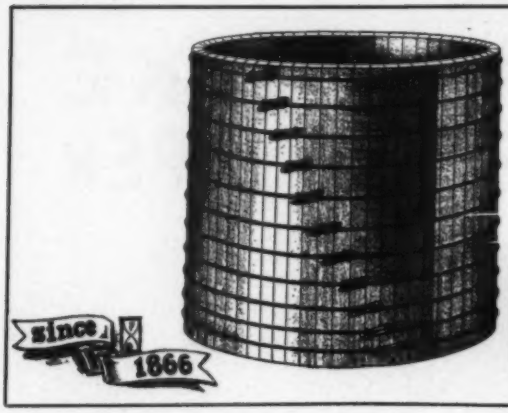
LEVER OR WORM GEAR OPERATED—SIZES 3" UP

METALS—ALL IRON, I.B.B.G., ALL BRONZE

12"—3 WAY—Fig. 401, Lever Operated

The "Improved Types" with balanced gates, while maintaining the same design of passageways through gate and valve as the older types, have taper gates to make operation more easy, take up wear and allow slight adjustment for hot stock. Face to face dimensions as older types. Self indicating and packings lubricated.

RECORD FOUNDRY & MACHINE COMPANY
LIVERMORE FALLS, MAINE, U. S. A.



. . . FOR DEPENDABLE WOODEN TANKS

The experience of Dunck designers and craftsmen, dating back over 70 years, is available to you . . . . for practical advice and dependable service on any tank problem.

DUNCK TANK WORKS, INC.
2425 No. 30th Street Milwaukee, Wis.

DUNCK'S Superior WOODEN TANKS

been in the employ of the St. Lawrence firm for the past fifteen years. He was the grandson of the late Joseph Ford, one of the first paper mill operators in Canada.

◆

GEORGE S. LEWIS

Formerly associated with pulp and paper interests in New England, George Sherman Lewis, one of the best known figures in the New England lumber world, passed away suddenly in Holyoke, Massachusetts, December 29 at the age of 71. Mr. Lewis once served as treasurer of the Wilmington (Vermont) Pulp and Paper Companies, treasurer of the Howland Pulp and Paper Company and treasurer of the Aroostock Pulp and Paper Company. Recently Mr. Lewis dropped his affiliations with the paper concerns to take charge of the Balsa Company, a subsidiary of the Great American-International Corporation.

◆

WILLIAM R. SEIGLE

William Robbins Seigle, chairman of the board of directors, vice-president and director of research of the Johns-Manville Corporation, passed away December 26 in Rochester, Minnesota. He was 59 years old.

Mr. Seigle, who had been with J-M for nearly forty years, began "at the bottom." He joined the old H. W. Johns Manufacturing Company in 1899 and worked at almost every job there for the next five years. Mr. Seigle was placed in charge of operations when the company started a program of expansion, included in which was the purchase of several other manufacturing firms. Mr. Seigle selected the 238-acre site for the main plant now known as Manville, New Jersey.

In 1916, before the company maintained its own research laboratories, Mr. Seigle organized the Norton Laboratories at Lockport, New York, and maintained these as a separate activity for the benefit of the company. The next year he established the W. R. Seigle Laboratories which later became incorporated as the Fibrefraks Laboratories. In 1828 the laboratories were purchased by Johns-Manville and all

William R. Seigle

J-M research activities were thereupon centralized at the Manville factory.

Mr. Seigle became vice-president of the J-M firm in 1917 and became chairman of the board in 1929. He was also president of the Asbestos Wood Company and a director of the Asbestos and Danville Railway. He is survived by his widow, two sons, and four daughters.

◆

MARSHALL D. LUPTON

Well known throughout the paper industry and prominent in civic affairs, Marshall D. Lupton, vice-president of the Beveridge Paper Company, Indianapolis, Indiana, passed away suddenly on December 6. He was 64 years old.

Mr. Lupton was born in Cincinnati in 1874, later moving to Miamisburg, Ohio, where he attended school. He was later employed by the Hager Paper Mill at Xenia, Ohio, and eventually became associated with the Beveridge firm in 1918 where he rose to the vice-presidency. His widow and two daughters survive him.

◆

▶▶▶ *Mrs. Evelyn Hollingsworth,* wife of Amor Hollingsworth, president of Tileston & Hollingsworth Company, passed away December 8 at her Milton, Massachusetts, home. Mrs. Hollingsworth was born in Bay Shore, Long Island, the daughter of Schuyler Livingston Parsons. She is survived by her husband, two sons, and a daughter.

◆

▶▶▶ Two Northern Paper Mills employees met with accidental deaths at the Green Bay (Wisconsin) plant recently. *Arthur Van Donsel,* 27, was suffocated after he became buried under two feet of fine coal which he had attempted to dislodge into an underground conveyor that carries the fuel into the boiler room. *Bernard Freward,* 25, died from the effects of a 220-volt electric shock sustained when he touched a cracked socket on an extension cord and became grounded on steam pipes.

◆

▶▶▶ THAT OBSERVANCE OF SAFETY RULES PAYS was demonstrated recently when a motor switch box blew out in the Port Edwards (Wisconsin) mill of the Nekoosa-Edwards Paper Company. The operator, following instructions, had taken a position at the extreme right of the starting mechanism. He turned his face away and threw the control lever with his left arm, thus averting painful and probably serious injuries.

HERE ARE THE REQUIREMENTS

Steady Operation without Clogging . . . This Warren pump has the distinctive self-cleaning, non-binding impeller with special vanes to prevent stock from working behind it and jamming the pump. Large inlets insure high density stock reaching the impeller.

Easy Maintenance . . . Extra heavy shafts prevent vibration and deflection. Oversize bearings keep bearing pressures low. Stuffing boxes are large, easy to get at and pack. Diagonally split casing makes rotating member easily accessible, simplifies inspection.

Low Power Consumption . . . Liberal clearances between impeller and wearing liners and properly proportioned passages help to maintain efficiency—help to keep your pumping costs down year after year.

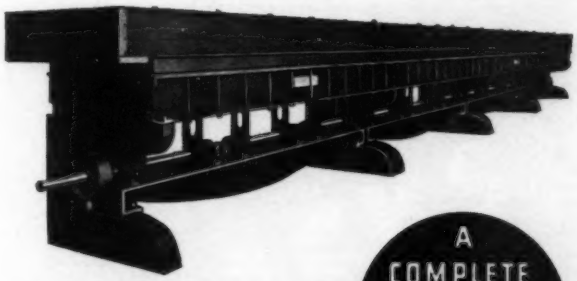
"They're Built to Fit the Job"

. . . *and* HERE IS THE PUMP TO MEET THEM

All Warren stock pumps have these time proven design features. Weigh them carefully on pump additions and replacements.

WARREN PUMPS

WARREN STEAM PUMP CO., Inc.
WARREN, MASSACHUSETTS



A COMPLETE LINE OF FLAT SCREENS

This New Murray Flat Screen is equipped with a special drive developed to meet exacting and heavy duty requirements with high speed. A modern equipment for the mill that must improve quality and cut operation costs to meet all competition. Quiet in operation. Efficient, these screens will do a better job of cleaning your pulp. No vibration, no pounding, no clatter. Highest efficiency, with lowest maintenance and lowest power costs. This drive can also be installed on your present screens. Write for prices on screens you require to modernize your mill. Remember, we make all sizes and types of construction to fit every requirement.

D. J. Murray Mfg. Co.

WAUSAU ~ WISCONSIN.

CHEMIPULP PROCESS INC.

CHEMICAL PULP MILL ENGINEERS

Chemical Pulping Processes ☆ Operating Surveys
Appraisals ☆ Estimates

500 WOOLWORTH BUILDING, WATERTOWN, N. Y.
3311 FIRST AVENUE SOUTH, SEATTLE, WASH.

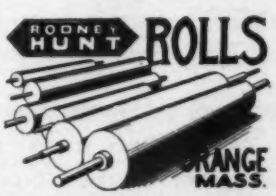
Associated with

CHEMIPULP PROCESS LIMITED
403 Crescent Building, Montreal, Quebec

PAPER MILL

WOOD ▼ METAL ▼ RUBBER

"Shaf-Tite" Rolls



WATER TURBINES
CANAL GATES
GATE HOISTS
VARIABLE SPEED DRIVES
TANKS, VATS, ETC.
ENDLESS FELT WASHERS

RODNEY HUNT MACHINE CO.
38 Maple Street, Orange, Mass.

New Catalogues and Publications

Alexander Bros., Philadelphia, Pa.—A handy little booklet containing illustrations, prices and specifications of the leather packing manufactured by this company has been issued lately by the firm. The booklet, which is pocket-size, contains much valuable information concerning leather packing for presses, elevators, hoists, pumps, brakes, jacks, compressors, pneumatic tools, valves, etc.

Bristol Co., Waterbury, Conn.—This company has recently issued a new bulletin (No. 517) on air switches for manual control. The bulletin contains photographs and drawings explaining the construction and operation of toggle air switches, selector air switches, throttling valves, bellows type air switches, air-electric pilot valve switches, safety switches and pilot valves.

Chain Belt Co., Milwaukee, Wis.—A very attractive new catalogue (No. 334) which is descriptive of the company's new screw conveyor line, has been issued lately by this firm. Sixty-four pages in length, this interesting release contains extensive information on screw conveyor installations, selections of screw conveyors, capacity charts, specifications together with detailed literature about the product. The catalogue also contains a complete catalogueing of Rex cast and Rex Salem type elevator buckets.

Crane Co., Chicago, Ill.—An extremely attractive and informative booklet, which presents in a pictorial manner the story of the Crane Company's research laboratories, has been published recently by this firm. The booklet, 47 pages in length and spiral bound, is replete with photographs and contains much well-written information regarding the equipment and actual work accomplished at the company's research laboratories. Included in the booklet are descriptive articles relative to the company's research in the fields of ceramics, metallurgy, welding, radiography, sanitation and hydraulics, heating and air conditioning, the basic sciences and photography. Several pages are devoted to descriptions and explanations of the functions of the company's library, design and development departments and works laboratory.

Detroit Stoker Co., Detroit, Mich.—A very interesting and attractive catalogue describing the company's multiple retort stoker has been put out recently by this company. Using photographs and blueprint drawings to good advantage this 16-page release presents to the reader a clear, detailed account of the construction, usage and installation of the stoker which is designed for large boilers and high capacities.

Elwell-Parker Electric Co., Cleveland, Ohio—This company's latest bulletin (A-8416) describes the IZ load carrier truck which has a rated capacity of 6,000 pounds. The bulletin, conveniently punched for loose-leaf filing, contains several illustrations of the truck showing construction and usage.

Flexible Metal Hose & Tubing Institute, New York, N. Y.—This organization has recently issued a new booklet entitled *The Fact Book of Flexible Metal Hose and Tubing* which presents a complete factual story of these important products and, in addition, graphically portrays their many uses to industry. The booklet, 19 pages in length, lists and illustrates principal types and forms of flexible metal hose and tubing and explains the underlying engineering principles which have made possible the development of the product. The booklet should prove interesting to every plant executive who uses hose and tubing in maintenance as well as to industrial executives whose manufacturing production or distribution problems involve the use of steam, gases, hot or cold liquids, etc.

Haynes Stellite Co., Kokomo, Ind.—An extensively revised folder, "Hard-Facing With Haynes Stellite Rod (Oxy-Acetylene Process)", has just been completed by this company. The revised folder presents the complete procedure for hard-facing steel wearing surfaces by the oxy-acetylene process.

International Filter Co., Chicago, Ill.—A new bulletin (No. 1700) issued by this company describes the firm's Hydrodarco Purifiers for removing objectionable tastes and odors from water. The bulletin shows how Hydrodarco, the activated carbon for water purification, removes organic tastes and odors by direct adsorption.

International Nickel Co., Inc., New York, N. Y.—The revised edition of this company's bulletin (T-9) on the engineering properties of "K" Monel is now available for distribution. The bulletin has been revised extensively in the light of the latest available information on the properties and useful applications of "K" Monel, a corrosion resistant wrought alloy of nickel, copper and aluminum.

Lincoln Electric Co., Cleveland, Ohio—Procedures for producing all type welds in mild steel, for welding all metals used to any extent industrially and for applying surfacing metal to meet any type of wear action in service, are given in a new bulletin recently issued by this company. The new 36-page release, which is printed in two colors, covers all types of welding and would be of value to all users of welding.

Michiana Products Corp., Michigan City, Ind.—Essential information and data on heat and corrosion resistant alloy castings is found in an informative bulletin (No. 108) recently put out by this company. Thirty illustrations are included in the release to indicate the variety of work done. Included also is an interesting section on centrifugal castings.

Northern Engineering Works, Detroit, Mich.—A new hoist catalogue (H-106) illustrating and giving ratings and dimensions of the firm's standard Hi-Lift hoists has been issued recently by this company. The catalogue describes the construction of the hoists and also gives much information as to its usages.

Permutit Co., New York, N. Y.—"Zeo-Karb," a new zeolite material for water conditioning, is the subject of a new bulletin (No. 2118) recently issued by this company. The product, claimed by the manufacturers to be practically non-siliceous and absolutely resistant to aggressive attack, is thoroughly explained in the new release. The company has also recently issued two other bulletins, one (No. 2153) being on the company's multiport valve control for pressure filters and softeners and the other (No. 2111) being on the firm's rate of flow indicator.

Republic Steel Corp., Cleveland, Ohio—An extremely attractive and informative bulletin describing and explaining the manufacture, adaptability and usages of the company's Galvannealed Sheets has recently been put out by this company. Using photographs to good advantage, the bulletin gives a good picture of the variety of uses for the company's product. Size charts are included in this release.

C. J. Tagliabue Mfg. Co., Brooklyn, N. Y.—This company has recently issued a new bulletin (No. 1178) relative to its new line of recorders and recorder-controllers with a full-size 9-inch chart having a 3⅞" pen travel. The new recorder for temperature and pressure occupies half the space but includes every feature of the larger 10 and 12 inch recorders. The bulletin gives complete specifications of the new product.

BOOKS

Paper Trade Terms—This glossary is the compilation of William Bond Wheelwright, 909 Foster Avenue, Chicago. It appeared originally in serial form in Volume IV of the *Paper & Printing Digest.* The book, bound with a patented metal binding, is paper covered and is printed upon several different kinds of paper stock. Arranged alphabetically, the terms listed and defined within the book run the gauntlet from *absorbent* at the beginning to *zone test* at the end.

Safety Rules for the Operation of Electric Equipment and Lines—This handbook, a publication of the United States Department of Commerce, contains safety rules governing operation of electrical equipment and lines in supply systems and communication systems. This very informative, 56-page handbook (H34) covers important safety procedures relative to handling live equipment or lines, meters, overhead lines, series street lamps, underground lines, supply stations and switchboards. It gives general rules for employers and employees and explains the scope and application of the rules set down in the handbook. Definitions are also listed and explained. The handbook, which supersedes Handbooks C49 and H8, may be procured from the Superintendent of Documents, Washington, D. C. The price is 10 cents.

How to Operate Under the Wage-Hour Law—This book, written from a layman's point of view, is a 248-page explanation of the law's provisions. It is the work of Alexander Feller, Member of the New Jersey Bar, and Jacob E. Hurwitz, Member of the New York Bar. Prefaced by a short discussion of previous wage and hour legislation, the book is broadly divided into four sections, the first of which discusses the scope and extent of the law; the second, the administration of the law; and the third, wage-hour law and interstate commerce. The fourth section is given over to appendices treating of analogous decisions by the National Labor Relations Board, the text of the Fair Labor Standards Act of 1938, and the administrative rules and regulations of the Act. An outline of the workings of the Wage and Hour Law is presented in chart form; while a second chart reveals some of the lesser known implications contained in the law which are further emphasized in the text. The book is attractively bound in stiff cloth cover with the over-printing in gold. It is priced at $3.50 a copy by the publisher, The Alexander Publishing Company, Inc., 60 Wall St., New York, N. Y.

Wood Pulp—Julius Grant, M. Sc., Ph.D. (Lond.), F. I. C., a well-known British writer on papermaking subjects, is the author of this volume. It is a work of more than 200 pages that is introduced by definining and explaining the nature of wood pulp and by commenting upon wood pulp in relation to other fibrous materials, upon wood pulp forests, upon the classification of pulping woods, and upon the literature of the wood pulp industry. The author then proceeds to discuss cellulose and the wood fibre, the identification and evaluation of pulping woods, the preparation of wood for pulping, the mechanical and chemical pulp making processes, the theory and practice in wood pulp bleaching, the mechanical purification and dewatering of wood pulp, by-products of the wood pulp processes, physical and chemical testing methods, and the uses of wood pulp. The book, bound in paper cover, is priced at seven guilders or about $4.00 per copy. The publishers are Chronica Botanica Co., Leiden, Holland, and G. E. Stecher and Co., New York, N. Y.

MISCO "C"
THE CORROSION RESISTANT ALLOY

Misco "C" digester neck rings and bottom sleeves

Misco "C" bottom crosses

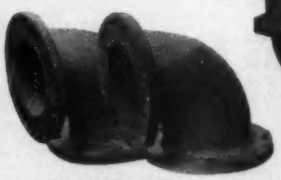
is recommended for

Digester neck rings · Digester bottom sleeves · Blow-off valves · Acid valves Acid pumps · Digester heads · Bottom crosses · Strainers · Fittings · Piping and all other equipment exposed to corrosion by sulphite acids.

MISCO "C"
"Centricast"*
CENTRIFUGALLY CAST
Stainless Steel PIPE
2" to 20"
Flanged • Threaded • Plain

*Trade Name Registered

Member Alloy Casting Research Institute



Misco "C" fittings, all types, all sizes

Misco "C" pump parts

10" Misco "C" "Centricast" pipe

MISCO
Heat and Corrosion Resistant Alloys

MICHIGAN STEEL CASTING COMPANY
One of the World's Pioneer Producers of Chromium-Nickel Alloys
1992 GUOIN STREET, DETROIT, MICHIGAN

PARIS BLACKS

DIXIE AND KOSMOS PARIS BLACKS

Blacks known for their tone, strength and miscibility. They assure smooth, unvarying shades that last.

UNITED CARBON COMPANY
CHARLESTON, W. VIRGINIA

SLITTERS
FOR PAPER MILLS

Forged Cutting Edge
Hard and Tough

Let us quote on your cutters for Cameron machines. "Red Streak" Cutters give satisfaction and economy.

Simonds Saw and Steel Co.
FITCHBURG, MASS.

1350 Columbia Road
Boston, Mass.

127 S. Green St.
Chicago, Ill.

311 S. W. First Ave.
Portland, Ore.

CURRENT MARKET QUOTATIONS

RAGS (Domestic)
f. o. b. New York City

NEW RAGS — per cwt.

Blue Overalls	4.75 to 5.00
Corduroy	2.25 to 2.50
Cottons—	
Washables, No. 1	1.65 to 1.75
Fancy Percales	3.00 to 3.25
New Soft Blacks	3.50 to 3.75
New Light Seconds	1.60 to 1.75
New Dark Seconds	1.50 to 1.60
Khaki Cuttings—	
Mixed	3.00 to 3.25
O. D.	3.50 to 3.75
New Canvas	7.00 to 7.25
New Mixed Blacks	2.25 to 2.50
Shirt Cuttings—	
New White No. 1	6.75 to 7.00
Silesias No. 1	4.50 to 4.75
New Unbleached	6.50 to 6.75
Fancy	2.00 to 2.25

RAGS (Domestic)
f. o. b. New York City

OLD RAGS

Roofing—	per cwt.
No. 1	1.10 to 1.15
No. 2	.90 to .95
No. 3	.80 to .85
Twos and Blues—	
Repacked	1.35 to 1.50
Thirds and Blues—	
Repacked	1.15 to 1.25
Miscellaneous	1.00 to 1.10
White, No. 1—	
Repacked	3.00 to 3.25
Miscellaneous	2.25 to 2.50
White, No. 2—	
Repacked	1.75 to 2.00
Miscellaneous	1.25 to 1.50

RAGS (Foreign)
ex dock New York City

NEW RAGS — per cwt.

New Dark Cuttings	2.25 to 2.50
New Mixed Cuttings	2.00 to 2.25
New Light Silesias	4.25 to 4.50
Light Flannelettes	4.50 to 4.75
Unbleached Cuttings	6.75 to 7.00
New White Cuttings	7.00 to 7.25
New Light Oxfords	4.00 to 4.25
New Light Prints	3.00 to 3.25

RAGS (Foreign)
ex dock New York City

OLD RAGS — per cwt.

No. 1 White Linens	7.00 to 7.25
No. 2 White Linens	6.00 to 6.25
No. 3 White Linens	4.25 to 4.50
No. 4 White Linens	3.00 to 3.25
No. 1 White Cottons	3.75 to 4.00
No. 2 White Cottons	3.25 to 3.50
No. 3 White Cottons	2.50 to 2.75
No. 4 White Cottons	2.00 to 2.25
Extra Light Prints	2.25 to 2.50
Ord. Light Prints	1.75 to 2.00
Med. Light Prints	1.65 to 1.75
Dutch Blue Cottons	2.00 to 2.25
French Blue Cottons	2.25 to 2.50
French Blue Linens	2.75 to 3.00
Checks and Blues	1.75 to 2.00
Linsey Garments	1.50 to 1.60
Dark Cottons	1.15 to 1.25
Old Shapperies	1.00 to 1.10

ROPE and BAGGING
f. o. b. and ex dock New York City

	per cwt.
Gunny No. 1—	
Foreign	2.10 to 2.20
Domestic	1.80 to 1.90
Wool Tares—	
Light	1.70 to 1.80
Heavy	1.90 to 2.00
Bright Bagging	1.60 to 1.70
Manila Rope—	
Foreign	2.75 to 3.00
Domestic	3.00 to 3.10
New Burlap Cuttings	2.25 to 2.40
Jute Threads—	
Foreign	2.75 to 3.00
Domestic	2.75 to 3.00
Strings—	
Sisal	1.50 to 1.60
Soft jute	1.75 to 1.85
Mixed	.50 to .60

WASTE PAPER
f. o. b. New York City

	per cwt.
Shavings—	
White Envp. Cuttings	2.30 to 2.50
Ord. Hard White No. 1	1.75 to 2.00
Ord. Soft White No. 1	1.60 to 1.75
Flat Stock—	
Stitchless	.75 to .80
Overissue Mags	.65 to .70
Solid Flat Book	.55 to .60
Crumpled No. 1	.45 to .50
Solid Ledger Books	1.30 to 1.40
Ledger Stock—	
White	1.10 to 1.20
Colored	.65 to .75
New B. B. Chips	.12½ to .17½
Manilas—	
New Env. Cuts	1.50 to 1.60
New Cuttings	1.30 to 1.40
Bogus Wrappers	.15 to .20
No. 1 Old Kraft	.50 to .60
News—	
No. 1 Wh. News Cuttings	1.30 to 1.40
Strictly Overissue	.40 to .45
Strictly Folded	.27½ to .32½
No. 1 Mixed Paper	.12½ to .17½

CHEMICALS
f. o. b. shipping point

Alum (Papermakers)—	
Lump, cwt.	3.40 -
Ground, cwt.	3.15 -
Powdered, cwt.	3.55 -
Blanc Fize—	
Bulk, ton	40.00 to 45.00
Barrels, pound	.0350 to .0375
Bleaching Powder—	
Drums, cwt.	2.00 to 2.25
Casein (Domestic Standard)—	
Ground (bags), lb.	9.00 to 10.00
Fine grd. (bags), lb.	10.00 to 10.50
China Clay—	
Domestic Filler	
Bulk (mine) ton	6.50 to 12.00
Domestic Coating	
Bulk (mine) ton	11.00 to 30.00
Imported (ship side)	
Bulk (lump) ton	14.50 to 24.00
Chlorine—	
Tank cars (wks) cwt.	2.00 to 2.55
Gelatine (silicin) lb.	.42 to .44
Glyc. (C.P.) drums, lb.	.1250 to .1300
Litharge, bbl., lb.	.07 to .0725
Rosin (Gum)—	
New York, 280 lb. barrel	
E, per bbl.	5.50
F, per bbl.	5.65
G, per bbl.	5.75
WW, per bbl.	7.77
Rosin (Wood), per bbl., carlots	4.00 to 5.05
Salt Cake—	
Dom. bulk (wks) ton	12.00 to 13.50
Imp. bulk on dock—	
(Atl. ports) ton	14.50 to 15.00
Soda Ash—	
Bulk (works) cwt.	.90 to .95
Paper Bags, cwt.	1.05 to 1.35
Barrels, cwt.	1.05 to 1.35
Soda (Caustic)—	
Solid, drums, cwt.	2.10 to 2.30
Ground and flake, drums, cwt.	2.50 to 2.70
Sodium Silicate—	
60 deg., 55 gal. drums, (works) cwt.	1.65 to 2.00
40 deg., 35 gal. drums, (works) cwt.	.80 to 1.20
Starch—	
Pearl, 140 lb. bags, cwt.	2.60 -
Pearl, barrels, cwt.	2.85 -
Paper (Sp.) bags, cwt.	2.70 -
barrels, cwt.	2.95 -
Sulphur (crude)—	
(mine) bulk, ton	16.00 to 19.00
Talc—	
Dom. 100 lb. bags (mine) ton	14.00 to 18.00
Imp. bulk, ton	25.00 to 40.00
Titanium Dioxide—	
Barium Pig., bbls., lb.	.05½ to .06½
Calcium Pig., bbls., lb.	.05½ to .06½
Zinc Sulphide, bbls., lb.	.09 to .095

CHEMICAL PULP
(Air-dry ton)

	per cwt.
Soda (Dom.) del'd. mill—	
Bleached	2.55 -
Sulphate (Dom.) f. o. b. mill—	
Bleached	2.25 to 2.75
Kraft No. 1	1.75 to 2.00
Kraft, Southern, del.	1.40 to 1.65
Sulphate (Imp.) on dock—	
Bleached	2.25 to 2.75
Kraft No. 1	1.50 to 1.65
Kraft No. 2	1.40 to 1.50
Sulphite (Dom. & For.) On dock—	
Prime bleached	2.35 to 2.50
Prime easy bleach	2.00 to 2.15
Prime strong unbl.	1.75 to 1.90

MECHANICAL PULP
(Air-dry ton)

	per ton
No. 1 Dom. & Can. (f. o. b. mill)	19.00 to 22.00
No. 1 Imp. (On dock)—	
Moist	24.00 to 25.00
Dry	22.50 to 24.00

PAPER
f. o. b. New York City

	per ton
Boards—	
Binders	71.00 to 77.00
Chip	25.00 to 27.50
Chip, sgl. mla. lined	40.00 to 42.50
Coated, white patent	
.016	57.50 -
.020 and heavier	52.50 -
Kraft liner	42.50 to 45.00
News	25.00 to 27.50

	per cwt.
Book (eased)—	
No. 1 Glossy Coat	10.50 to 12.50
No. 2 Glossy Coat	9.25 to 10.75
No. 3 Glossy Coat	8.15 to 9.50
No. 4 Glossy Coat	7.65 to 9.00
No. 1 Antique	7.65 to 9.00
No. 2 Offset	7.00 to 8.25
A Grade E. F.	6.80 to 8.00
A Grade Super	7.05 to 8.25
B Grade E. F.	6.25 to 7.50
B Grade Super	6.50 to 7.75
C Grade E. F.	6.00 to 7.00
C Grade Super	6.25 to 7.25
D Grade E. F.	5.70 to 6.75
D Grade Super	5.95 to 7.00
Ivory & India	.50 cwt. extra

	per cwt.
Bonds (Rag Content)—	
100% Rag	
Ext. No. 1	39.10 to 46.00
100% Rag	31.05 to 36.50
85% Rag	
75% Rag	23.60 to 27.75
65% Rag	20.50 to 25.00
50% Rag	17.55 to 21.50
25% Rag	14.65 to 17.75
Regular Colors	1.00 cwt. extra
Heavy Colors	3.00 cwt. extra

	per cwt.
Bonds (Sulphite)—	
No. 1	8.60 to 10.50
No. 2	7.70 to 9.50
No. 3	6.85 to 8.25
Colors	1.00 cwt. extra
Glassine (f. o. b. mill)—	
Embossed (25 lb. up)	12.25 -
Bleached (25 lb. up)	11.25 -
Unbleach (25 lb. up)	9.50 -
Greaseproof—	
Bleach. (25 lb. up)	9.25 -
Unbleach. (25 lb. up)	8.75 -
Ledgers (Rag Content)—	
100% Rag	
Ext. No. 1	40.25 to 47.25
100% Rag	32.20 to 37.75
85% Rag	29.90 to 35.50
75% Rag	24.75 to 29.00
65% Rag	21.65 to 26.25
50% Rag	18.70 to 22.75
25% Rag	15.80 to 19.25
Regular Colors	1.00 cwt. extra
Heavy Colors	3.00 cwt. extra
Ledgers (Sulphite)—	
No. 1	9.75 to 12.00
No. 2	8.90 to 10.75
No. 3	8.00 to 9.75

	per ton
News—	
Rolls (Contract)	50.00 -
Rolls (Spot)	(nominal)
Sheets	58.00 -

	per ream
Tissues (Carlots)—	
Anti-Tarnish M. G.	.75 -
Colored	.875 -
Kraft	.75 -
Manila	.60 -
Napkins, semi-crepe (12¼ lb. to M shts.) per cs.	.46 -
Napkins, full crepe and emb'sed (12¼ lb. to M shts.) per cs.	.52 -
Toilet, Bleached (M shts.) per cs.	5.80 -
Toilet, Unbleached (M shts.) per cs.	3.25 -

	per case
Towels—	
Bleached	3.10 to 3.65
Unbleached	1.95 to 3.30

	per cwt.
Wrappings (Kraft)—	
Extra Quality	4.75 to 5.25
Super-Standard	4.12½ to 4.02½
Northern Standard	4.00 -
Southern Standard	3.37½ to 3.50

Wrappings (Sulphite and Bleached Kraft)— (Rolls, f. o. b. mill)

	per cwt.
Bleached papers—	
M.F. & M.G. Waxing, 20 lb. (Carloads only)	5.75 -
(10,000 lbs.)	6.00 -
Drug wrapp. 35 lb.	6.00 -
Unbleached Papers—	
Com. Grd. Butch. 40 lb.	4.25 -
No. 1 Butchers	4.50 -
No. 1 Imit. Parch & Dry Fin. Groc. Sulphite 30 lb.	4.875 -
No. 2 Imit. Parch & Dry Fin. Groc. Sulphite 30 lb.	4.625 -
Steam Finish, 50 lb.	3.625 -
Water Finish, 40 lb.	4.25 -
Manilas—	
Envp. Mla., Sub. 16-40 (No. 1)	4.75 -
Envp. Mla., Sub. 16-28 (No. 2)	4.50 -
Envp. Mla. (Prices based on large sheets untrim'd ream-marked, in bdls.)	
Wrapp. Mla. 35 lb. up—	
No. 1	5.00 -
No. 2	4.75 -
M. G. Sulphite (other than Waxing)	
Grade A-25 lb.	5.00 -
Grade B-25 lb.	4.75 -

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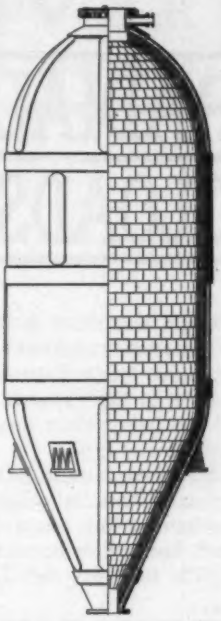

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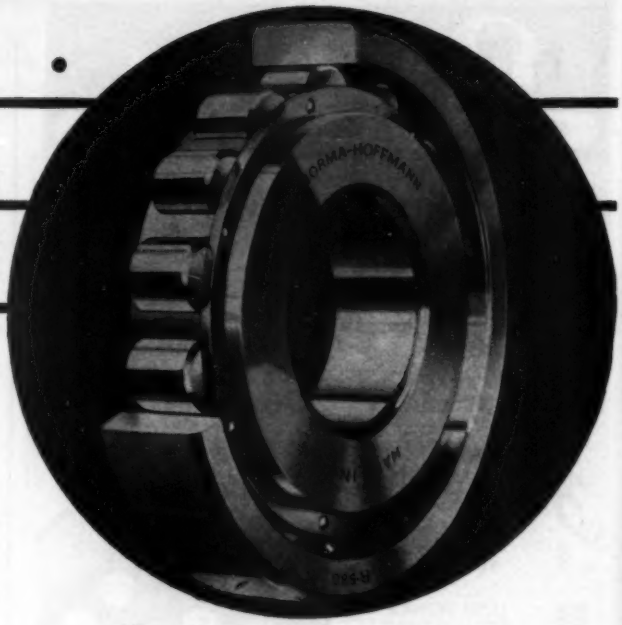

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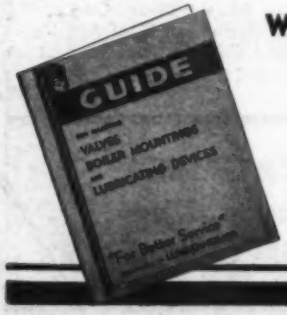

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